# Mochine Shop APRIL, 1942 VOLUME 14 · NUMBER 11 Contents

HOWARD CAMPBELL, Editor

# Published monthly by GARDNER PUBLICATIONS, Inc. 431 Main St., Cincinnati, Ohio

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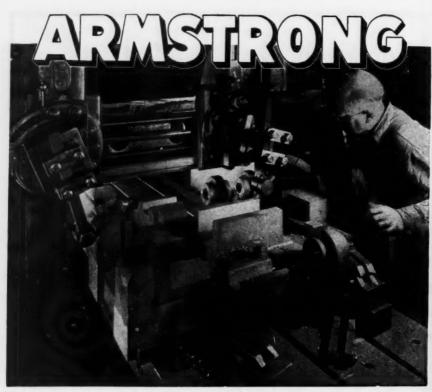


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# Do the same work with 1/10 the High Speed Steel

Stop wasting critical High Speed Steel by using forged tools for work that can be done more efficiently with ARMSTRONG TOOL HOLDERS. Each ounce of high speed steel in an ARMSTRONG TOOL HOLDER will do the work of 10 ounces in a bar tool. With single ARMSTRONG TOOL HOLDERS replacing complete sets of forged tools, the large amounts of high speed steel tied up in cumbersome single-purpose solid tools or wasted in heavy tool stumps can be saved.

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# Machine Shop

CINCINNATI, OHIO

APRIL, 1942

Vol. 14, No. 11

# We Present --

- —as the initial offering in this month's issue—a picture-story presenting some of the interesting tasks that are being performed in our National Defense Program. Tanks—anti-aircraft guns—airplane engines—all these are now being produced by men who a few weeks ago were building automobiles.
- —on page 114—the second half of Russell L. Packard's article "Foreman Training by Approved Methods." In this section Mr. Packard tells how to select the subjects, how big the groups should be, what methods of instruction should be used, and so on.
- the sixth and last of the series "Tooling the Automatic Screw Machine" by B. C. Rundquist, which starts on page 130. We find that there is a great deal of interest in this subject and expect to start a new series on Screw Machine Tools within a few weeks.
- —a paper which, in view of the impending scarcity of tungsten and chrome, should be of interest to all users of high speed steel and carbide cutting tools. This is the paper that was read by F. Lloyd Woodside at a recent meeting of the Cincinnati chapter, ASM, on "Heat Treatment of Molybdenum High Speed Steels." You will find it on page 152.
- —an interesting and productive arrangement for obtaining high production on the cutting off of small work in an abrasive cut-off machine. Written by Walter G. Porter, it starts on page 166.
- several useful and interesting tools and devices in the section "Ideas from Readers," a number of pieces of "Modern Equipment at Work" and the usual features.

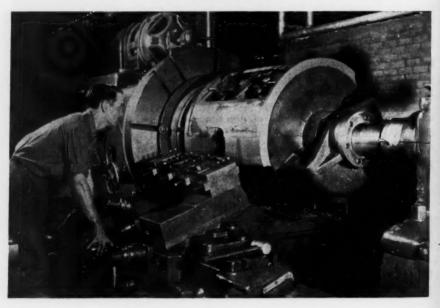
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# Production for National Defense

as viewed in some of our arsenals, aircraft, gun, and tank plants

Turning a Section which Serves as a Bearing when assembled to the Turret of one of the M-3 Heavy Tanks now being Turned out at the Chrysler Tank Arsenal, near Detroit. The Section is Swung Between Centers in a Fixture which also serves as a Counterweight. Four Turning Tools and two Facing Tools are Used, and Dimensions are held to Close Limits to Assist in Obtaining the Maximum

of Accuracy with the Guns



MODERN MACHINE SHOP

April. 1942

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Drilling and Reaming the Shoe Track and Plates for an M-3 Heavy Tank of the Type being Built at the Chrysler Tank Arsenal. The Machine is an Eight-Spindle Baker, of Special Design for This Job and Equipped with a Special Self-Clamping Drill Jig

Using a huge Ra-dial Drilling Machine and Index Fixture, these Workers are Drilling and Tapping Holes in a 4,000-Pound Turret Casting for the Mounting Plate of the 37 MM Anti-Aircraft Gun to be Mounted on a Chrysler M-3 Tank. These 28-Ton Monsters are now being Turned Out in Quantity by the 10,000 Workers at the Chrysler Tank Arsenal, Detroit





Assembling the Tracks to a 28-Ton M-3 Tank in the Erecting Department of the Chrysler Tank Arsenal When ready for the Field, One of these Tanks is Capable of Speeds over 25 Miles an Hour. Each Tank is Equipped with a 75 MM Field Artillery Gun and a 37 MM Anti-Aircraft Gun, as well as Four Mounted Machine Guns and the Various Unmounted Guns Carried by the Crew. Each Tank is Powered by a 400-H.P. Wright Whirlwind **Aviation Engine** 

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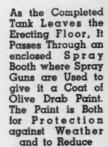
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Upon final O.K. by the Government Inspectors, Each of the M-3 Tanks now being Built at the Chrysler Tank Arsenal, Detroit, is Picked Up by a 50-Ton Crane and Lowered onto a Flat-Car, Where it is Securely Anchored for Transportation to the Army Camp Where it is to Be Used. Each Tank Weighs More than 28 Tons

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Assembling Gun Carriages for 37 MM Anti-Aircraft Guns in One of Pennsylvania's Large Industrial Plants. After the Frame Has Been Assembled, These Workers Assemble the Gun Mount, Outrigger Bearings, and Other Parts to the Frame. Many of the Parts, Such as the Outrigger Bearings, are Assembled by Welding



142

Assembling the Traversing Bearing to a 37 MM Anti-Aircraft Gun Carriage. The Machining, Construction, and Installation of these Precision-Built Ball Bearings must be Accurate, Because upon their Unfailing, Smooth Action Depends the Ability of the Gunner to Follow his Rapidly-Moving Target. A Couple of "Tenths" is Important on these Balls and Gear Teeth

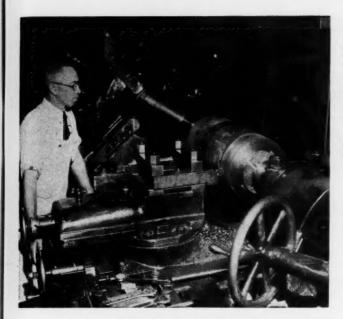




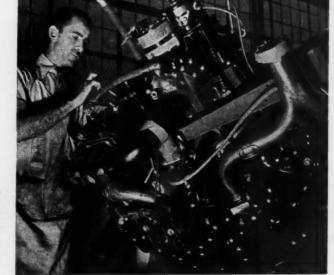
Close-Up View
Showing Construction of the Huge
Ball Bearing upon
Which the Gun, Its
Mechanism, and the
Gun Pointer Revolve While in Action. Both Lower and
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Balls must be
Ground to Extremely Fine Limits of
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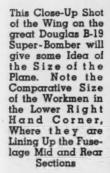
Turning the Thread Surface on the Barrel of a Heavy Gun of Medium Caliber. Note that a Steadyrest is Used to Aid in Supporting the Weight of the Gun so that it does not all Fall on the Tailstock Center, a Strip of Bronze or Copper being used Under the Steadyrest Jaws to Serve as a Bearing



Assembling the Carburetor to a 400 H.P. Wright Whirlwind Engine Prior to Testing the Engine for Use in One of the Huge M-3 Tanks



Buick and Air Corps Officials Inspect a Propeller Test Stand where Buick-Built Bomber Engines, now in Volume Production in a Huge New Factory, are Given a Variety of Inspection and Engineering Tests



(All photos from OEM.)



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Tools That Put More Production Minutes Into the Hour.

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Milwaukee MILLING MACHINES

# Foreman Training by Approved Methods

Second half of article, in which the author discusses methods of selecting subjects, methods of instruction, and class schedules

## By RUSSELL L. PACKARD

Director of Supervisor Training,
Packard Motor Car Company, Detroit, Michigan

A NUMBER of conditions should be kept in mind regarding the place where group conferences are to be held. If possible, a central location should be selected in an effort to save the time of the department heads in going to and from the meetings. The room should be large enough to make crowding unnecessary, and should be located where people not involved cannot see or hear what is going on within. One of the considerations should be the possibility of noises which might distract the attention and prevent obtaining the best results.

As far as general equipment is concerned, the following items should be considered:

(a) A blackboard with ample space should be available. This also calls for chalk, an eraser, and a pointer.

(b) There should be plenty of bulletin space available for hanging up posters, circulars, and other material.

(c) Tables and chairs should be available in sufficient quantity to accommodate the proper seating and uses of the group members, and should be arranged for the best results. If possible, all members should

be seated where they can easily see, hear, and follow the leader as well as other members of the group.

(d) Provision should be made to utilize modern visual aids of all kinds, such as moving pictures, slide-films, charts and other aids. A verbally-conducted session appeals only to the sense of hearing, while visual-verbal sessions appeal both to the sense of sight and of hearing. The use of illustrations of various kinds will produce best results.

(e) Lighting and ventilating conditions should carefully be checked. A stuffy room induces drowsiness and inactive minds. Lights should be standard, so that eye-strain will be unnecessary.

(f) An opportunity might be provided for smoking. Group members will appreciate an informal atmosphere and enter more readily into conference discussions. A disorderly atmosphere will be avoided by having a number of ash-trays placed at proper intervals on the tables.

(g) The conference should be kept clean. A tidy room suggests orderliness to members of executive groups and the idea may in some



Office of Director of Supervisor Training at Packard Motor Car Company

measure carry over into their departments.

# 11. Approving a Subject

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The subject selected for discussion should be carefully written up in complete form ahead of time, and should be approved for the purpose by someone who has been given that responsibility. In some organizations it is approved by a subject committee; in others by an educational committee or Master Group composed of Division Superintendents or Managers.

The advisors might be men who have had previous experience as group leaders or who hold jobs that particularly represent phases of work related to possible subjects. As an example; some companies have an advisory group composed of such executives as the Personnel Director, Safety Director, Chief Physical, and one or two Production Managers or Superintendents and the Training Director. The latter might serve as secretary, as he more directly serves as

the responsible head and leader in group discussion.

### 12. Size of the Group

There are several factors which should be considered in determining the size of a conference group. The total number to attend the school will, of course, have some bearing upon the number of groups to be operated. The leader's time and responsibility will suggest how many groups he can successfully handle.

From the standpoint of effectiveness alone, a group should not exceed twenty or so. If active participation is anticipated and desired, then the number should be kept as small as possible. Some members will be reluctant to speak out before the rest if the group is too large, due to a desire to avoid possible embarrassment. The combined experience of the members present should be utilized to the greatest possible advantage.

## 13. Membership in Groups

The practice of different companies varies sharply in the matter of se-

lectees for group membership. To a great extent it should rest with a policy set up by the company involved. The question of whether the men attend the training conference on their own time or the company's time is an important one to consider. If company time is used, the men will be selected by their division managers or superintendents. In some concerns where the conferences are held on company time, the membership is limited to salaried supervisors. When the supervisors meet on their own time, the set-up is not so easily controlled. But whatever plan is used, all eligible members should be included to prevent any feeling of having been slighted by being left out. As supervisors are added, they should be included in the groups. As a matter of fact, the new supervisor needs the most instruction.

## 14. Hour for Meeting.

Again the question arises as to whether the supervisors attend school on company time or on their own time. If they attend on their own time, the hour set for the meeting should rest largely with the judgment of the majority. If the meeting is held on company time, then the working day should carefully be studied in order to select an hour that will be most convenient for all concerned.

It is not a good idea to set the school hour at the beginning or stopping of shifts; the department heads need to get the jobs started off right before they can feel free to leave, and the same condition obtains at the end of the shift. The work must be finished and the department left in condition for the next shift. So other and more satisfactory hours should be selected for conference sessions.

Consideration should also be given to the different kinds of work done by the supervisors. Some companies favor having mixed supervision included in a class instead of having all from the same division or from departments doing allied classes of work. It is easier to set a time for holding sessions when the supervisors included in the class are from the same division, but the results of the plan may not warrant it.

# 15. Length of Sessions

There is a marked variation in the amount of time set apart for supervisor training classes in different plants and industries. Some of the most common procedures are, however: a two-hour weekly session; one-hour weekly or bi-weekly session; one-hour weekly or bi-weekly session; one and one-half hour weekly or bi-weekly session; and so on.

The length of a session usually depends upon many factors, a few of which are: management's policy as to amount of time available; amount of time necessary for the subject, number of supervisors involved; importance of subject under discussion; production schedule and conditions; amount of time available to each of the supervisors; and so on. Many plant managers feel that a class should be held every week to assure continuity and that bi-weekly meetings are too far apart, while others take an opposite view.

### 16. School Schedule

The day upon which the session is to be held should be decided upon as well as the length of the session then a copy of the school schedule should be posted in the schoolroun and duplicate copies distributed to all those concerned. If more than the class is held on the same subjet, supervisors should be assigned to the group which meets at the time that is most convenient for them. The they should attend their class sessions unless an emergency makes it impossible. If the emergency can be

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# SUPERVISOR TRAINING SCHEDULE

Each supervisor will attend one session in a two-week period.

Each supervisor is requested to attend school as assigned. If it is impossible to come in at the assigned time then another session may be selected during the two-week period. A copy of this schedule will be placed on the "School Bulletin Board."

Day	Hour	Week
MONDAY-	10:00 - 11:00	1st and 2nd
	1:00 - 2:00	1st and 2nd
TUESDAY—	10:00 - 11:00	1st and 2nd
	1:00 - 2:00	1st and 2nd
	6:00 - 7:00	lst
WEDNESDAY—	10:00 - 11:00	1st and 2nd
	1:00 - 2:00	lst
	6:00 - 7:00	1st and 2nd
THURSDAY—	10:00 - 11:00	1st and 2nd

anticipated, it may be possible for the supervisor to attend another session. If he misses out on one of the subjects, however, the sequence is broken for him and subsequent references to the instruction included in this subject will be meaningless.

## 17. Methods of Instruction

Many methods of instruction are used, such as lecture, dramalogue, moving pictures and sound films, reading courses, demonstrations, conferences, and others. The one selected should depend upon the results desired and the material available. Again, the subject along may lend a deciding factor to the question.

If information alone is to be given to the class, upon a subject with which the group has had no experience, the lecture method will probably be best. If the subject directly refers to a special local problem that is common to the group, the discussion method will be likely to produce the best results. Any method adopted should be subject to approval by the members of the group, and all mem-

should b bers considered in or der that it might be of common interest. In more recent years the conference menod, with some mixture of other methods where such methods would produce the desired re sult, seems to be the most poplar.

# 18. Preparation of the Subject

The subject matter to be use

in the class should be prepared before the leader attempts to present it to the group, although this may require hours of research and preparation I the leader is faithful to his task and conscientious, the subject may be written and rewritten many time before it is considered satisfactory. But to begin with, the leader should have a clear conception of the idea or principle that he wants to develop in the class-room, and then he should carry the discussion to a satisfactor end. If he is a good leader he will not allow the discussion to drift away from the subject; he will maintain a firm control of the discussion, mustain order at all times, and keep the discussion to the subject, pulling the discussion back onto the theme time a tendency develops to digress

Among the form features that are often used upon which to base a decussion are: Subject Title, Purpos, Objectives, Aids, Discussion points and questions, and a good Summan or Conclusion. An effort should be made to develop visual aids to be used with the subject story in and

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fort to obtain the desired results. An illustration of some kind, as long as it has some bearing on the subject, immediately focuses and multiplies the interest of the group. However, if a chart is used, it is wise not to try to show too much on any one sheet as the group may be looking at and thinking about some point other than the one under discussion at the time.

# 19. The Summary Write-Up

A summary of each subject should be written up and distributed to the members of the group after the subjest has been presented and discussed. There are several methods of preparing the summary. In some companies the summary for each subject is given out as soon as it is ready; in other firms the summaries are made up in book form at the end of the school season and then distributed to those who attended. The summary should cover only the essentials, we ten in protective terms, and then fore should not be too long. The sujects should be covered clearly, to cisely, in understandable language and worded in a careful, tactful maner.

# 20. The Supervisor Training Office

The headquarters for superviming training should be an office containing the usual equipment of a desion two, files, cabinets, telephone and other essentials. Included should be a library containing current issues of the more important industrial magnines, digests, government reports, business reports, and publications bearing the subject from which me terial may be drawn for discussion

All schedules, records, reports at other valuable information and disshould be filed for future reference. This office should have data concering the problems that exist in

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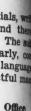
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• Let's face the facts. America is in desperate need of war materials. The turret lathe is a key machine tool in the production of these materials. Warner and Swasey are working three shifts, night and day, to turn out new turret lathes. In 1942 we will deliver six times as many machines as we built in any normal year. Yet the combined output of new machines by all turret lathe manufacturers falls far short of the need.

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parts of the plant. The office should have a man or two available who could go out into the plant and contact the supervisors periodically.

# 21. Outings and Get-Togethers

In some companies an effort is made to develop a spirit of unity and cooperation among the members of the supervisors groups by fostering social affairs for the members and their families periodically. If only one such affair is held yearly, it was ally takes place at the end or beginning of a school season. In other words it may serve as a conclusion for the year's session or as a mean of motivating a new school year.

If it is an annual affair, it is usally done in an elaborate manner. It may be held when and where many activities are scheduled and the fetivities might include events for which prizes may be awarded, with a luncheon, or it might be held in hotel with an elaborate dinner, speaking, and perhaps a programmed show

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The school season varies considerably in length in different companies. In some companies the season is cludes 20 weekly discussions while others provide longer programs. The nature of the work done by the companies and the extent of their operations should have some bearing of the length of the training courses. Most companies make no attempt to hold conferences during the summer, and in other concerns the season is divided into two parts — fall and spring series.

In some companies the courses at built upon a series of subjects, seried of which may be covered during the year. Sometimes there is a breathing period between any two ries setups. When social affairs the supervisors are totally paid in by the company, they should be very carefully planned. A few of the fetures involved in this considerable are (a) find out how much is and

ice should POP'S ORIGINAL "SCHOOL OF FILING" lable wh and cor (Every machine-shop should have one) dically. ers Use the right file effort b unity and embers d No excuse for file abuse! The best files have fostering nbers and If only ly, it us or begin these trade-marks! In other conclusion a mean l year. POP SEZ NEVER LEAN ON A FILEit is us IF YUH MUST LEAN anner. I AND BOY!-ON SOMETHIN', USE A SHOVEL! ere man DOES HE GET d the fes-THINGS DONE! rents for POP'S A STICKLER FOR ded, with FILIN' held in EFFISHUNCY! er, speak med show consider ompanies eason in ons while ams. The

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MODERN MACHINE SHOP

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able for the purpose, (b) determine the variety of activities to be covered, (c) assign and supervise committees to work out the details, (d) get all committees together to settle on the final setup, (e) assign necessary tasks to responsible people and have them properly stationed to see that every activity takes place on time and smoothly, and (f) have all borrowed equipment and materials returned and the place used put in order.

Some companies hold several inexpensive get-togethers throughout the year in which case the company and the supervisor share the cost involved or the men may pay their own way

on a proportional basis.

In some of the larger companies divisional get-togethers are held instead of trying to get all of the supervisors in the firm together at one time. This method has its advantages as well as its shortcomings. While divisional executives may become

better acquainted, this system does not promote the need which is usually present for inter-divisional cooperation. It may be better to set up affairs that lead to company cooperation and solidarity instead of divisional unity.

Summary

In conclusion it may be said that a careful analysis of the situation should be made before an attempt is made to start a foremen training program. In most cases experience sooner or later will dictate certain changes in the original plans, from which improvement will undoubtedly result. In this article the author has attempted only to outline the chief features of a supervisor training plan for the benefit of plant managers who are aware of the value of supervisor training and have been considering the installation of such a plan. To summarize:

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Both books will gladly be sent without charge on request.

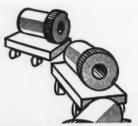
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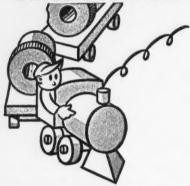
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18. See that the discussions are properly covered in summaries for distribution.

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acturer of this mobile unit says: "The performance records of our units... are infinitely better than they would be if this roll out feature were not made possible by your flexible tubing."





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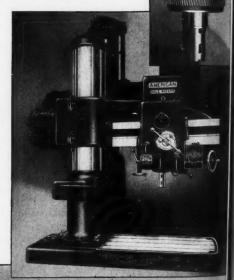
is the newest thing in spindle drives—is a masterpiece of engineering and adds years to the effective life of the machine.

It consists of two gears located on the lower portion of the spindle at the bottom of the head, thus bringing the driving gears as close as possible to the work. By using two driving gears, a large one for the low speeds and a small one for the high speeds, severe operations are performed at low tooth pressures and high-speed work at low gear velocities. This ideal combination cannot be secured in any other way.

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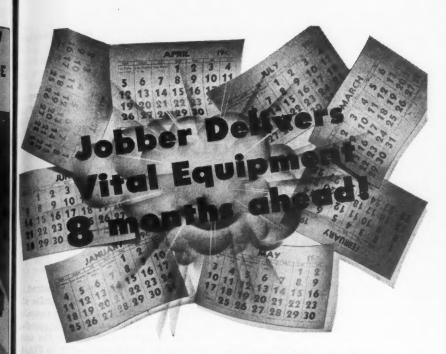
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# Tooling the Automatic Screw Machine, VI

Attachments for High Speed Drilling—The Under Cutting Fixture—Taper Boring and Turning—Magazines— Pick-Off Attachments

By B. C. RUNDQUIST

The National Acme Company, Cleveland, Ohio

OF all the attachments that can be made for the multiple spindle automatic machine, the high speed drilling attachment is probably more universally used than any of the other attachments. It makes possible the drilling of small holes in large diameter work without slowing down feeds for end-working tools and lengthening the time of the job. It

can be used in any position desired.

The high speed drilling spindle attachment consists of a drive (usually in the gear box) and a drill spindle, held in a holder clamped to the endworking tool slide as shown in Fig. 1. The drill spindle runs either in antifriction bearings or bronze bushings, and—being held in a holder on the tool slide—the drill is naturally car-

ried forward into the work at the same feed as is used for the other end-working tools.

As is well-known, there is a limit to the feeds and speeds that can be used in drilling holes, especially when

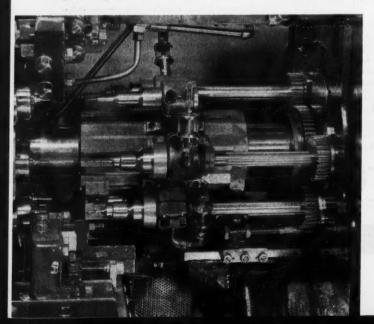


Fig. 1 — High Speed Drilling Attachments in Use on Acme Multiple Spindle Automatic Machine

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using drills of the smaller diameters.
Drilling a small hole is then accomplished by driving the drill spindle in such a manner that the drill rotates in the opposite direction from the work spindle, thus increasing the number of revolutions per minute of the drill in order to bring it up to cutting speed and decreasing the feed

tions depending upon available space in the gear box for driving gears of the size necessary.

Since the r.p.m. of the work spindle is governed by the cutting speed obtained on the stock size, the cutting speed on any drill used for drilling a hole is necessarily slower in proportion to its size. If the differ-

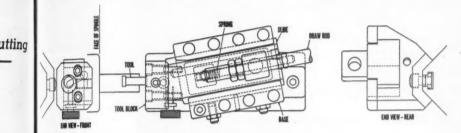


Fig. 2—Drawing of Under Cutting Fixture for Use on Automatic

per revolution of the drill from the given feed of the end working tool slide.

The drill must be driven from the spindle drive shaft in order to keep a constant ratio of work spindle to drill spindle, regardless of what change gears are used for different spindle speeds.

Standard high speed drilling attachments are usually driven at the same speed as the work spindle, but in the opposite direction. Special drives for special cases can be made when necessary within certain limitaence in cutting speed of a drill and the tools working on the periphery of the stock is not too great, and the drill is of a size large enough to stand the feed applied to the endworking tools, it is allowable to use a drill held stationary on the regular tool slide position.

The cutting speed of a drill should never be as high as that of forming or point-cutting tools. But very often the difference between the sizes of the drill and the stock is so great that the cutting speed of the drill is too low to allow the drill to function



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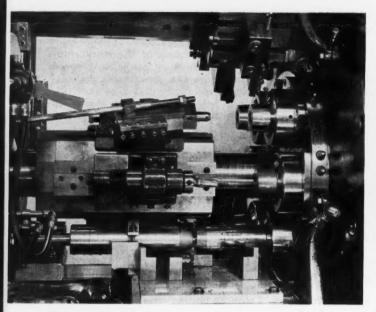


Fig. 3—Under Current Fixture Mounted of End - Working To Slide

properly. Also, on drills under % inch in diameter, the feeds become too fast for the drill to stand without breaking and thus causing trouble for the operator. Then it is necessary to use high speed drilling attachments.

For example: If the stock size of a piece is 2 inches diameter, and a cutting speed of 110 feet can be used, the work spindle will have to have an r.p.m. of 210. If a ½-inch diameter drill is to be used and held stationary, the cutting speed of the drill would only be about 27 feet. If the drill were carried onto the work at 0.010 inch feed for the other tools on the end working tool slide, the drill would not cut very long.

Now, if a standard high speed drilling attachment were used in this case, the drill would be rotated in the opposite direction at the same speed as the working spindle, hence the cutting speed of the drill would be figured on double the r.p.m. of the work

spindle, result in a cutting speed of about 5 feet. Thus, a 1/2 inch drill with cutting speed d 55 feet with feed of 0.005 inch per revolution i allowable and will continue drilling without too frequent sharpening of breakage of the drill.

# **Under-Cutting Fixture**

Many jobs on a multiple spindle automatic call for holes to be drilled and either ground or tapped afterward, requiring recesses or undercuts at the bottoms of the holes. One of several kinds of undercutting fixtures can be used for this work and of course one should be used that is applicable to the particular machine on which the job is to be done. The simpler any attachment is made, the better it works and the less trouble an operator will have in using it. The drawing Fig. 2 shows such a fixture, of the type whose basic design can be applied to most any machine, yet it is very simple and has nothing to get out of order when once set up.

The whole unit, shown in Fig. 3, is mounted on the end working tool slide, and is carried to and from the work with the regular slide movement. The undercutting fixture consists of a base, carrying a slide with

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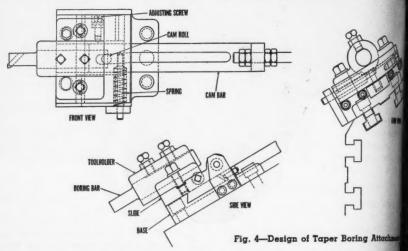
SERIES 24 BRYANT INTERNAL GRINDER



tool block and tool. The base is bolted to the end-working tool slide and provides ways for the undercutting slide to travel forward and backward with a spring and stop keeping the slide at the forward position except when drawn back by adjustable nuts on the stationary draw rod, this being attached to the gear box or some other part of the machine.

be set to give enough movement the tool to clear the side of the me when entering and returning and cut the desired depth of recess a cording to the angle at which is slide is set.

It will be noticed that the centerine of the tool does not coincide with the centerline of the work in the machine. When designing and determine the content of the work in the machine.



But the slide is mounted in ways that are on an angle with the axis of the machine so that, when the slide with tool has reached desired depth and is held stationary through the draw rod while the base continues its forward movement, the slide and tool are carried laterally and the tool cuts the recess.

On the return movement of the slide base, the spring between the base and slide returns the slide laterally to its forward position in the base and then recedes out of the work along the draw rod, remaining in this position on its base until it is brought forward again to the nuts on the draw rod in the next cycle of the machine.

The nuts on the draw rod should

mining the size of the cutting of the tool and shank, care should taken to provide for clearances, these sizes determine how much the centerline of the work the should be set. Also, in small by the tool must be ground in set way that there is room for chip come out of the hole without rule on either the tool or the shank.

# Taper Boring Fixture

Simplicity and accuracy must kept in mind when designing a tachment for taper boring. simpler it is, the easier it is to a facture and for the operator is up and operate. If a taper been be finished accurately on the matic, it not only saves a second sec

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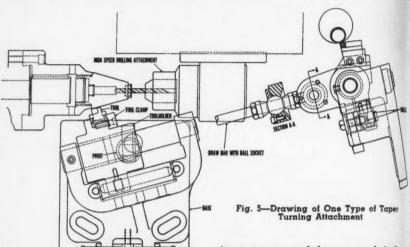
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operation but many times it saves the cost of a jig or fixture to make the bore concentric with other diameters or faces of the piece.

The drawing Fig. 4 presents a taper boring attachment the basic

The slide carries a cam roll underneath which rolls in a cam path milled in a cam bar that is held stationary from the gearbox or other convenient place on the machine. The cam path can be cut with the desired



design of which can be used to advantage on automatics. It is held on the end working tool slide and carried forward and backward, to and from the work, with the regular movement of the end working tool slide, and can be placed in such position that the tool will be in the correct location for the boring of the piece in the work spindle. The unit consists of a base carrying a slide for the lateral movement, and a cam bar controlling the movement of the tool to give the desired taper to the bore.

Any kind of a boring bar can be held in the tool holder, which can be adjusted laterally with an adjusting screw to control diameters. The tool holder, in turn, is held on the slide. The slide has a dovetail with an adjustable gib which holds the slide solidly and eliminates any chatter in the boring bar.

taper on one end, long enough to bore the piece being machined. From the rear end of this taper the cam roll path can be carried straight back a little farther than the complete travel of the tool slide to allow for the return and approach of the tool slide without changing the position of the boring bar. Also, a spring is provided underneath the slide to keep it in the far position except when brought forward by the cam roll.

# Taper Turning Attachment

There are several kinds of taper turning attachments. Some are made for particular jobs, while others can each be used for a number of jobs, providing there isn't too much difference in the angles of taper or lengths of turn. Some manufacturers have what they call universal taper turning attachments, which can be used for many jobs but only each on its own particular machine. Like all other attachments, it has to be de-

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**Gun Barrel Rifling** 

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The Sheffield Precisionaire is extremely fast in action, has the highest degree of accuracy in both process and final inspection—may be used either as a limit comparator for checking tolerance or as an indicating gage for classification of parts. It gives an accurate check not only of internal diameter, but bell mouth, out-of-round and average diameter.

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signed to apply on the machine that is to be used for the job. The drawing Fig. 4 shows the design of one that gives very good results, and will there while a draw bar pushes the tool holder forward along the work either from the end working tool slide or other independent lever motion.

The unit consists of a base casting bolted to the cross slide, carrying a shaft for the tool holder to slide on, and set at the angle that is required on the piece to be made. It will be noticed that a pivot is placed in one of the T-slots of the slide The base is then placed on pivot, and through the adjusting screws in the rear of casting and the screw slots, the correct angle is obtained before bolting down solid.

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This base casting carries a round shaft to serve as a means for the tool holder to slide back and The tool holder forth. has two rolls which work between two flat keys. The lower key is held stationary in the base.

while the other key is held in a block that has an adjusting screw at either end to raise and lower the In this way the tool holder same. can be held rigidly-yet not too tight -so as to eliminate any chatter in A vertical dovetail tool is the tool.

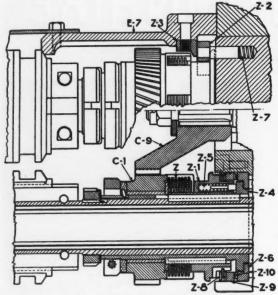


Fig. 6—Drawing of Spindle Stopping Mechanics as Used on Acme Gridley Automatic Machine

give a general idea as to what has to be considered in designing a taper turning attachment.

The attachment shown in Fig. 5 is held on the side slide. It is carried forward to the work with the approach of all the slides, and dwells

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Fig. 7—Cross-Milling Head Mounted on Side Slide

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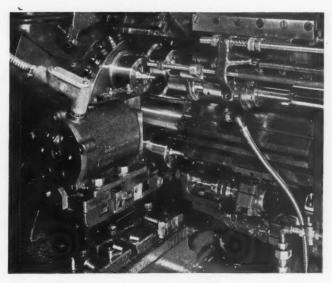
keys.

used with a clamping plate to hold it in place, providing an easy and quick way to remove the tool for sharpening and resetting again.

On the top of the tool holder is a ball and socket joint with a draw bar to actuate the tool holder and tool at the

proper time along the diameter to be turned. Sometimes this draw bar can be operated from the tool slide, or from some independent levers. With a ball and socket joint at the tool holder, and free movement on the other end of the draw bar, the cross slide can move forward and backward during the approach and return of the slide. Of course the slide will have to be forward before the turning tool starts cutting, and dwell there until the cut is completed.

The drawing also shows the application and use of a high speed drilling attachment and drill at the same



time in this position.

#### Spindle Stopping Mechanism

Multiple spindle automatic machine design not only permits dividing long operations between two or more working positions to increase production, but also presents the opportunity to perform many special operations which are usually considered secondary operations, to be done on other machines.

Cross-milling, cross-drilling, endslotting and similar "secondary machine" operations are performed on multiple spindle automatics with the use of a spindle stopping mechanism,

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to stop rotation of the work spindle in a certain position where tools for this operation are installed. Special heads, carrying drills or milling cutters, driven either from the gear box or independent motors, can be designed to fit the machine for doing this work in the position desired. The ers and springs **Z-7** in the spindle carrier. As the spindle indexes in the position where it is to be stopped cam **Z-3** actuates yoke **Z-2** to stop the spindle. As the spindle indexe out of this position, yoke **Z-2** is to leased from cam **Z-3** to permit the spindle to rotate.

Fig. 8—Magazine Attachment in Loading Position on a Side Line

drawing Fig. 6 presents the design of a spindle stopping mechanism, as used on the Acme Gridley automatic machines, showing the cam and yoke and cross section of the mechanism on the spindle. On these machines, the spindle stopping mechanism can be arranged to stop the spindle in any position except the two bottom positions.

For this application, each work spindle must be equipped with a spindle stopping mechanism. A cam Z-3 is bolted into the guard E-7 in the position where the spindle is to be stopped. Each spindle is equipped with yoke Z-2 held in place by plung-

When this mechanism is installed, special gears are used at C-9 on the end of the spindle drive shaft and at C-1 on the spindle. Gear Ci drives the spindle through friction discs Z and sleeve Z-4 which latter is keved to the spindle. Slidin sleeve Z-1, spring loaded, is keye to sleeve Z-4 and operated by yoke Z-2 to disengage friction discs Z to stor the spindle, and by spring Z-5 to engage discs to start the spindle

Friction discs Z-8 on sleeve Z-1 and in spindle carrier A-1 act as a brake to stop the spindle when friction discs Z are disengaged. Discs Z-4 are pressed together between sleeve Z-1 and spacer Z-9. Spacer Z-9 is thus forced against cushioning collar L-1 and spindle carrier. The cushioning collar using a wave spring Z-10, and the solid spacer, Z-9, is the type illustrated. On some sizes of machines this spacer Z-9 is itself spring loaded with helical springs for cushioning against collar Z-6.

Thus yoke Z-2 and sliding sleer Z-1 stop the spindle by disengaging friction discs Z and engaging brain he spindle dexes into e stopped -2 to stop le indexes Z-2 is repermit the n this ism is in Special re used at the end e spindle haft and on the Gear C he spind friction and sleeve ich latter d to th . Sliding -1, spring is keyed e Z-4 and rated b 2 to dis friction to stop ndle, and ng Z-5 to discs t e spindle e Z-1 and a brake friction Discs Z4 en sleeve r Z-9 is ng collar The cushspring. -9, is the



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What can I learn from this peace-time product to guide me in making plans for the post-war Battle for Business?

ALTER EGO: Well, the first big lesson is that the manufacturer points out that if this \$900 car were built by the non-welding methods of 15 years ago, the cost would run \$3000.

That's a saving of \$2100 by welding and mass production. Could it be possible for me to apply the same method to my product to cut costs and boost volume for the tough years ahead?

ALTER EGO: You know there is a simple plan for changing over to welding, like that of the auto builders:

- Appoint a man of experience and give him authority to supervise welding developments.
- (2) Change one part at a time, starting with the simple levers, brackets, etc.

That sounds familiar. Doesn't The Lincoln Electric Company of Cleveland, Ohio, GUAR-ANTEE that you'll profit from a plan like that? Why not write them for suggestions for changing over?

ALTER EGO: Literally, "one's other self"—the still, small voice that questions, inspires and corrects our conscious action.

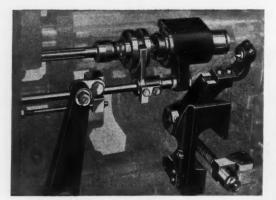
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discs Z-8 at the same time, and start the spindle by reversing the operation.

A cross-milling head mounted on a side slide is shown in Fig. 7.

#### **Magazine Attachments**

The advantages of having a magazine attachment that can be applied to a multiple spindle automatic machine can readily be seen. Such an attachment provides an opportunity to increase the production of parts by dividing the operations into two or three cuts on several spindles, and using two or more tools for different operations at the same time by using the different slides on an automatic.

For any semi-finished part, other casting of forging that requires several operations to finish and for which a magazine hopper can be made to feed the parts one by one to the loading position of the automatic, consideration should be given to this method of production before deciding to do it some other way.

Most magazine attachments on a multiple spindle automatic consist of

a base casting, carrying the feeding hopper, held on one of the side slides in the loading position a shown in Fig. 8. The hopper must be made in such a way that, as the parts are loaded at its open end, the pieces will be guided down its length to the feeding point in the position the part should occupy when loading

The camming of the slide on which the magazine is carried must be made to carry the slide forward at the proper time to load the part into the collet and return out of the way until the next cycle of the machine At the lower end of the hopper some mechanism must be devised to hold back all parts in the hopper except the particular one that is to be loaded.

In operation, the slide comes to its forward position at the proper time,



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TWIST DRILL AND MACHINE COMPANY

NEW BEDFORD, MASS., U. S. A.

NEW YORK STORE: 130 LAFAYETTE ST. - - CHICAGO STORE: 570 WEST RANDOLPH ST.

the collet being in position and ready to receive the part. A pusher bar arrangement mounted on the end working tool slide pushes the part into the collet, either against the face of the collet or against some stop inside of the spindle, the collet tightens up to hold the part, and the pusher bar returns far enough so that it will not interfere with any overhanging part of the loading mechanism of the hopper at the return of the slide on which the magazine is mounted.

After the operations on the part have been completed, the spindle carrier is indexed in the usual manner and the next spindle comes into position still carrying the finished part which had been loaded into it the last time around. When the collet is opened, before the side slide with the magazine attached moves forward again, the finished part is ejected either through a spring arrangement

inside the spindle or by a rod at atted from the stock feed slide at a rear of the machine. Then the spind is ready to receive the next part the magazine.

The pusher bar arrangement on the tool slide should be made with spring back of the bar for a cushion ing effect, and should also have a de tent arrangement or some other mechanism that will act as a releas for the pusher bar if the finished par in the spindle from the previous load ing has not been ejected, or if is piece being loaded does not seat # self properly. Such mechanism wi restrict the forward motion of the pusher bar so that the pusher by will stand still and compress a spring while the end working tool slide in ishes its forward motion. This will prevent breaking of any of the part on the attachment and avoid a shift down of the machine for repairs.

The hopper and loading mechanism



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INC.

ril, 1942 April, 1942



CIRCULAR & BAND SAWS . SHEAR BLADES . RED IND HACK SAWS . RED LANG THES . FOUL HIES

## FOR NATIONAL DEFENSE SPEED UP

SPEEDALOY TOOL BITS AND TIPPED TOOLS



#### SPEEDALOY

- •SPEEDS UP PRODUCTION 50 to 150%
- **OSPEEDS UP CUTTING OPERATIONS**
- **OSPEEDS UP COST SAVINGS**
- •SPEEDS AWAY TIME LOSSES

#### WHAT IT IS

SPEEDALOY is a cast, cutting material made up of special tungsten chromium alloy. It fills the breach between high speed steels and tungsten carbides in both performance and price.

#### WHAT IT DOES

SPEEDALOY wears longer than high speed steel and resists shock more than tungsten carbides. It will machine all materials except manganese steel and chilled iron. It should be run faster with about the same depth of cut and feed as high speed steel — thus increasing production 25 to 75%.

SPEEDALOY has proven exceptionally effective on stainless and other nickel or chrome alloy steels.

SPEEDALOY can be supplied in tool bits, flats, and a wide variety of tipped tools available for immediate delivery.

Literature on request.



is always made for application on to the particular part for which the built, and it is good policy when co sidering an attachment of this kin to ask the advice of the manufactor turer of the machine that is to used for the job.

#### Pick-Off Attachments

Pick-off attachments, one of which is shown in Fig. 9, are made for tw First, to come forward purposes. and chuck the finished part in the cut-off position before it is cut of with a spindle and collet carried a the end working tool slide to support the piece so that the cut-off tool ta complete its cut through the h without the part wobbling off in before being cut off, thus leaving straight smooth face on the end the part and eliminating a second operation. Second, to come forward and grasp the part as it is being or off and then move back again until burring or facing tool can be brough up into position, either on an aux iliary arm or on a side slide, the carrying the part forward agains the tool again, after which it return and drops the piece into a work chut for finished pieces.

This requires a spindle with a col let, controlled by a finger holder an fingers to close the collet as it move forward to pick off the finished part actuated to return part way, still holding the collet closed, again more forward to tool on side slide or aux iliary arm for last operation, and re turn again before dropping the part into the work chute. It means quite a complicated mechanism and more expense than most attachments, but when the operation is so short, ye necessary, it is often cheaper to d it this way than to make a second operation out of the job.

To "Keep 'em Flying" you must "Keep on Buying" Defense Savings Bonds

Stamps regularly.

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THERE'S SOUND
"TOOL SENSE"
BEHIND
"STANLEY"

STANLEY ELECTRIC DRILLS pack the power for double dury —as a portable drill, or as a drill pers—when mounted in a Stanley Bench Stand. Fourteen models—capacities from 1/4" to 7/4"



STABLEY SAFETY SAWS are powerful, well balmeed tools. Safety guard keeps cutting edge covered at all times. Base tilts 45° for bevel cuts. Simple depth adjustment. W-9 shown has cutting capacity of 3½".

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The widespread demand for Stanley Electric Tools in war production work means that we may not be able to supply you as soon as we would like to.

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Ninety years of "Stanley Tool Sense" demand your attention and consideration when comparing tool values. It was not easily acquired . . . but it's an important reason why Stanley Electric Tools stand up better on the toughest jobs, and help deliver more finished work per day.

The No. 72—7" (or No. 92—9") Grinder and Sander is a good illustration of the way Stanley Electric Tools are planned for the job. Plenty of power for the toughest production and repair work, yet its compact design and handy "balance" permit operation 'round-the-clock without fatigue. Use it with abrasive discs or wheels for a hundred different jobs – such as smoothing castings or heavy welds, removing rust and paint, scouring and cleaning vats.

A typical example of how all Stanley Electric Tools are designed for *industrial* use and are built to give service. Stanley Electric Tool Division, The Stanley Works, Shanley New Britain, Connecticut.

## STANLEY ELECTRIC TOOLS

\*\*\* A Complete Line for Industry \*\*\*

To Finish The Job Quicker . . .



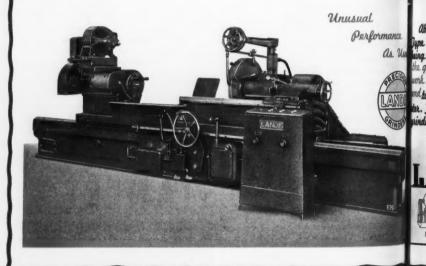
# A TANK MANUFACTURE LANDIS LIKE THE

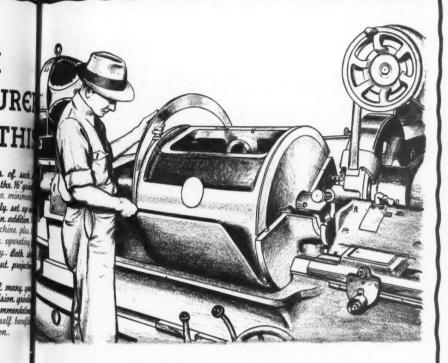
That valuable time can be saved by the proper choice of grinding equipment is illustrated by a large corporation engaged in the manufacture of tanks.

This corporation employs a Landis 16" x 96" Jupe & Plain Hydraulic Grinder with a gapped table for the grinding of tank gun rotors measuring 30" in diameter. Ordinarily such parts would require a machine of over 30" swing, however, because the rotors are short in length and are relatively light, and because the gapped table allows work as large as 40" in diameter to be accommodated they can be ground on the 16" swing machine.

The time saving features of sections arrangement are obvious. On the 16 gia handling time is reduced to a minimum cause the work can be speedily set up no waste machine nor space. In addition very compactness of the machine plu handiness of controls reduce operating tique and increase efficiency. Both is and long work with or without project can be ground.

tan on yourself of many pa Why not avail yourself of many pa experience in the field of precision public by asking Landis for recommendation Then you, too, may find yourself builtie from added grinder production.





Nove is shown the Landis 16"x 96"

You B Plain Hydraulic Grinder now
way used by a large corporation for
the grinding of tank gun rotors. The
work table is gapped at the headstock

od to accommodate work 40" in diamto. The gap is 34" in width. When
widing, the rotor is mounted on a

special fixture equipped with blocks on the ends to receive the centers of the headstock and footstock.

Jhis 16"x %" Jupe & is provided with a fill piece for the gap so that the machine can be used for grinding other parts when not being used to grind rotors.

## LANDIS TOOL CO. WAY NESBORO, PENNSYLVANIA



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MULTIPLE V BELT HEADSTOCK DRIVE



HYDRAULIC WORK
TABLE TRAVERSAL
WITH STEPLESS
SPEED RANGE



RAPID ELECTRIC WHEEL FEED

200

## Heat Treatment of Molybdenum High Speed Steek

By F. LLOYD WOODSIDE

Climax Molybdenum Company\*

THE shortage of tungsten and chrome are working a hardship in the manufacture of the so-called "carbide" tools and tungsten high speed steels, in view of which manufacturers, in an effort to conserve the more precious materials, are turning to the use of molybdenum as being the only substitute that will serve the purpose.

Tungsten and chrome are available only on priority, and, even at that, the supply is limited and will be until trade routes to the Orient are re-established. Practically all of our chrome comes from the Philippines and most of the tungsten from China, although a small amount of tungsten is being mined in Cuba. Molybdenum, on the other hand, is available in ample quantities from mines within the boundaries of our own United States and so we will be able to keep our machines producing. But inasmuch as production men are not as familiar with "moly" as they have been with other cutting tool materials, a little study will be necessary on the part of many of them in order to be able to make the best use of

"moly" tools.

The initial difficulties seem to an developed in the hardening pross. It should be borne in mind to where hardening equipment is an able in which decarburization can controlled, there is no particular problem involved in the replacement of tungsten high speed steel with the proper molybdenum high speed steel with the proper molybdenum high speed steel with the proper are differences in temperature and timing cycles, but the broad governal principles are similar.

Where proper equipment does not exist, the special precautions indicated below should be helpful.

High speed steel is defined by the O.P.M. as follows:

"The term 'high-speed steel' as herein used is defined as including two classes of alloy steels:

(I) "Class A high-speed stell is hereby defined as either alloy steel containing not less than 60 per cent carbon and containing more than 3.0 per cent molybdenum; or alloy steel containing not less than .60 per cent carbon containing 7.0 per cent or less tungsten, and containing more than 3.0 per cent molybdenum.

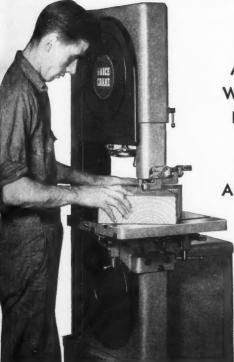
(II) "Class B high - speed steel" is hereby defined as allor steel containing not less than 55 BOIC

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<sup>\*</sup>Prepared from material released by the OPM and delivered before the Cincinnati Chapter, American Society for Metals.

## Do You Cut Any Of These In Your Plant?



**IRON & STEEL BRASS & COPPER** ALUMINUM & ZINC WOOD & PLYWOOD BUILDER'S BOARDS BRAKE LINING CASTING SPRUES **ASBESTOS & RUBBER** PIPE

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A newer, safer, more powerful all-purpose 14" band saw. Saves space. Saves time a countless cutting-off operations in foundry and plant. Ideal for all kinds of contour work in large and small die and tool shops.

New—larger capacity under the guide provides 85/8" clearance.

New-sealed construction greatly increases operator safetyNew-strapping strong welded trame lengthens blade and ma-chine life.

New-powerful, 8-speed ball bearing gear box drive. 90 to 1100 ft.p.m.

Modern, Light Machines for Working Wood, Metal, Plastics

BOICE-CRANE COMPANY TOLEDO, OHIO

April, 190 April, 1942

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MODERN MACHINE SHOP

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per cent carbon and containing more than 12.0 per cent tungsten. Note: Other alloy materials may be present in the steels of either class, but steel not containing the substances named, in the amounts specified, shall not be considered high-speed steel."

The compositions for molybdenum high speed steels as given in Table I, steels of Type III decarburize in than steels of Type I or II. In mo cases steels of Type III can be treated without surface protection the same equipment used for tags sten high speed steels.

(3) Consult with the firms from whom you purchase your high spectrum steels for their best advice in high light of your particular problem.

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#### TABLE I Compositions For Molybdenum High Speed Steels

	(These are not Specifications)			
	TYPE I  Molybdenum-Tungsten		TYPE II	TYPE III
			Molybdenum- Vanadium	Tungsten- Molybdenum
	A	B*		
C	.7085	.7682	.7090	.7590
W	1.25-2.00	1.60-2.30	_	5.00-6.25
Cr	3.00-5.00	3.70-4.20	3.00-5.00	3.50-5.00
V	.90-1.50	1.05-1.35	1.50 - 2.25	1.25-2.00
Mo	8.00-9.50	8.00-9.00	7.50-9.50	4.00-6.00
Co	See footnote	4.50-5.50	See footnote	See footnote

\*Cobalt may be used in any of these steels in varying amounts up to 9.00% and the variety be as high as 2.25%. When cobalt is used in Type III, this steel becomes susceptible decarburization. As an illustration of the use of cobalt, Type IB is included. This is steel 11 the U.S. Navy Specification 46S37, dated November 1, 1939.

include only those steels most widely used and established for general commercial tool applications. There are additional compositions which are used for special applications. Since they require special heat treatment to properly handle, their use is not discussed in this practice.

For those who are not skilled in handling molybdenum high speed steels and who do not have decarburization under good control, it is recommended that at present they adopt the following procedure:

(1) Use the required substitution of molybdenum high speed steels, selecting the type that will produce the best results and give the least trouble in working. The smaller tools are heat treated by shorter cycles and thus the general hazards are less.

(2) Proceed on the basis that

(4) Take steps to obtain moder efficient hardening equipment on the premise that regardless of the kind of high speed steel being hardened proper hardening promotes better tool life and better tool life in itself is a big step in conservation.

Forging — These steels can be forged like the tungsten type but a slightly lower temperature, at Table II. When heating the most denum high speed steels for forging they should be held in the furnace in the shortest time possible at the forging temperature.

Like all types of high speed stellarge pieces should be preheated 1000-1200 deg. F. before heating 1 the forging temperature.

Slightly oxidizing atmospheres at preferred when no protective contains used. No protection is necessary

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## ROUND 4: AIR GOT AROUND FASTER

108: Cone-grinding cast iron containers for enameling. Formerly used flexible-shaft grinders. Wanted to get into the corners and all around . . . FASTER.

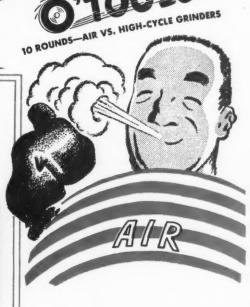
Had ample air supply. Called in the Rotor Analyst for unbiased opinion on AIR vs. HIGH-CYCLE grinders.



AIR out-pointed HIGH-CYCLE (and the semi-finalist, flexible shafts) these ways:

- Increased production 10% compared to former type of grinders.
- Cut maintenance cost 15% to 20% compared to former type of grinders.
- Easier to handle. Their Rotor AIR grinders weigh only 9 lbs., compared to 12 lbs. for HIGH-CYCLE grinders. Made possible greater maneuverability and smoother grinding for this light-duty work.

Purchased 5 Rotor Powerplus AIR Grinders-and reordered two more recently.



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#### SPARKS mean OUTPUT KEEP 'EM FLYING!

The Rotor Analyst has a strong plan of attack to boost production with portable tools-at a minimum of investment cost. Shops using all types of tools have benefited from his practical knowledge and unbiased analysis. His service is yours for the asking.

The Rotor Analyst has 65 different AIR tools and 59 different HIGH-CYCLE tools with which to solve your problems.

ROTOR TOOL



#### TABLE II (1)

#### Heat Treatment of Molybdenum High Speed Steels

TYPE I	TYPE II	TYPE III
Molybdenum-Tungsten Ä and B	Molybdenum- Vanadium	Tungsten- Molybdenum
1850-2000° F.	1850-2000° F.	1900-2050° F.
1600° F.	1600° F.	1600° F.
1450-1550° F.	1450-1550° F.	1450-1550° F
1150-1350° F.	1150-1350° F.	1150-1350° P
1250-1500° F.	1250-1500° F.	1250-1550° F
2150-2250° F. (2)	2150-2250° F.	2175-2275° F
2150-2225° F.	2150-2225° F.	2150-2250° F
950-1100° F.	950-1100° F.	950-1100° F
	Molybdenum-Tungsten A and B 1850-2000° F. 1600° F. 1450-1550° F. 1150-1350° F. 1250-1500° F. 2150-2250° F. (2) 2150-2225° F.	Molybdenum-Tungsten A and B         Molybdenum-Vanadium           1850-2000° F.         1850-2000° F.           1600° F.         1600° F.           1450-1550° F.         1450-1550° F.           1150-1350° F.         1150-1350° F.           1250-1500° F.         1250-1500° F.           2150-2250° F.         2150-2250° F.           2150-2225° F.         2150-2225° F.

 Hardening Curves of the various types are appended.
 Under similar conditions Type B requires a slightly higher hardening heat than Type I
 The higher side of the hardening range should be used for the large sections and the side for the small sections.

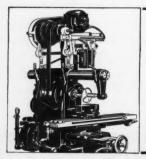
for ordinary sized forgings unless long heating cycles are involved. Borax is a very effective coating but has the disadvantage of making the surface of the steel very slippery at the forging temperature so the operator should take due precautions. To minimize the fluxing action on the furnace refractories, an excess of borax should be avoided.

After forging it is desirable to cool slowly to about 300 deg. F. to avoid cracking from forging strains. This can be accomplished by furnace cooling or burying in lime, mica, or dry ashes, etc. Tools that have been forged should be machined or rough ground, after annealing, to remove possible surface defects and to reduce amounting of grinding after hardening.

Annealing - Like tungsten speed steels, these steels should annealed after forging and be hardening, or when rehardening required. Box annealing is alm preferable. When annealing partial finished tools, and generally w surface protection is of prime imp tance, it is recommended that a iron chips or other mild source carbon be used for packing materi

Heat slowly and uniformly to temperature given in Table II. thoroughly and then cool slowly the furnace. The steel should to taken from the furnace until it is low 1000 deg. F.

After machining and before ening it may be necessary to re harmful machining strains by



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#### rive SMOOINI

Enjoy increased out-put with Remco Motor Drives, plus drive smoothness. Speed changes made without res tool from cut. No tool marks. No noise. Shockless! takes hold by gradually slipping belt—simple friction action. Rigid drive construction. Three point suspensinstead of one or two points. Vibrationless! Easily, que installed. Get Folder! Remco Products Corp., State Hay Streets, York, Pa.

for LATHES, SHAPERS, DRILLS, MILLING MACHINES,

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NEW "SAFETY" DEVELOPMENT FOR PORTABLE GRINDERS ... GRIPSLOK 0-2050° F. )-1550° ₽ )-1350° F )-1550° P -2275° F -2250° E -1100° E han Type I and bein hardening inding wheel failures are most generally used by one of the following: 1—Injury durg is alway shipment, 2—Incorrect mounting of the el, 3—Accidental injury during operation. ling partia ure against injuries, property damage and thy time delays by insisting on the portable erally w prime imparting wheel which prevents a broken wheel ed that a milying apart . . . the new SAFETY GRIP-K GRINDING WHEEL. B d source

. . . HOW SAFETY **GRIP-LOK WHEEL WORKS** 

Represents the abrasive wheel. Safety Grip-Lok Wheel has annular recesses on both sides concentric with arbor hole. Standard flange same as provided on all portable grinders. Relief in flanges. When wheel is mounted and tightened flanges 3 enter recesses 2 and overhang ends of abrasive hub. Resilient composition washer is located in recess 2 on both sides of wheel. When pressure is brought on washer, flanges 3 enter recesses 2 by compressing the washers.

When the flanges ("B" in photograph of collar above) compress the composition rubber and cork washer in the recess ("A" in photograph of wheel above) they allow the raised hub, "C", to come up under the recess of the flanges, "D", and act to prevent segments of a broken wheel from flying outwardly.

We can promptly supply "SAFETY" GRIP-LOK WHEELS in all grains and grades. For the phone number of the "Safety" Sales Office or Warehouse nearest you, consult the list below. REMEMBER PEARL HARBOR"

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ing at 1150-1350 deg. F.

Hardening-The general method of hardening molybdenum high speed steels resembles that followed with 18-4-1, but the hardening temperatures (Table II) are lower and more precautions must be taken to avoid decarburization especially on tools when made from Type I or II when the surface is not ground after hard-Salt baths and atmosphere controlled furnaces represent an excellent type of equipment for hardening molybdenum high speed steel. The use of coke fires or the blacksmith forge is not recommended for hardening any high speed steel, but if this type of equipment is all that is available, Type III may be so treated if an excess of air is avoided. However, simple surface protection in such equipment is safer practice even in the case of tungsten high speed steels.

The usual method is to preheat

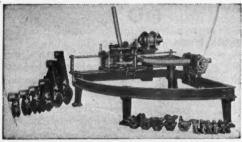
uniformly in a separate furnace 1250-1550 deg. F. and transfer to high heat furnace maintained at the hardening temperatures (see Tail II).

When heated in open fire or in fi naces without atmosphere contri these steels do not sweat like 184 Consequently, the proper time in the high heat chamber is a matter of This time approximate that used with 18-4-1 although slightly longer when the lower pr of the hardening range is used. Must can be learned by hardening m liminary test pieces and checking on the hardness fracture and stro It is difficult to state exa heating time as this is affected in temperature, type of furnace, si and shape, and furnace atmosphere

Rate of heat transfer is most min in salt baths, and slowest in on trolled atmosphere furnaces with high carbon monoxide content. GU

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## THE AMERICAN COLD PIPE, CONDUIT AND TUBE BENDING MACHINES

QUICK DELIVERIES . .

HAND OPERATED TYPES in capacities of 1 in., 2 in., 3 in., 4 in. MOTOR OPERATED in three capacities,  $\frac{1}{2}$  in. to 4 in.,  $\frac{1}{2}$  to 6 in., and  $\frac{1}{2}$  in. to 8 in.

Early shipments on hand operated machines; on motor powered from four to six weeks.

Wire or air mail letter for printed matter and prices.

Three New Machines: No. 1—For bending extra heavy pipe up to 3 in. No. 2—For bending all kinds of thin gauge tubing without use of mandrel. No. 3—For bending IPS conduit.



## AMERICAN PIPE BENDING MACHINE CO., INC. 25 PEARL ST. BOSTON, MASS., U. S.

## TRIPLE-SHIFT OPERATION CALLS FOR E-TOUGH MOTORS



GUNS . . . In this arms plant, Tri-Clad motors drive . line of milling machines.



GUNS . . . Greater fire power for democracy grows out of sure-fire Tri-Clad motor performance. These machines are in operation in an arms plant.



AIRCRAFT . . The light weight and compactness of this Tri-Clad motor make it an excellent choice for machines like this.

#### TRI/CLAD motors will help you get "all-out" production

THE extra-protection features\* of the Tri-Clad motor reduce the possibility of interruptions due to motor failure. Chips and coolants are kept out. The stator winding, of Formex wire, is well-nigh impervious to oil, moisture, and heat shock. Improved bearings contribute greatly to sustained operation even under difficult conditions. Give your war production extra protection-Tri-Clad motors. General Electric, Schenectady, N. Y.

\* Extra protection against physical damage, electrical breakdown, and operating wear.



If you need motors, why not ask your G-E representative about Tri-Clad types and sizes now result. Ltd. available?

April 18 GENERA

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#### VACUUM PUMPS

Also Used as Pressure Blowers, Gas Boosters, and Air Motors.

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188-3 Christie St. Newark, N.

Quenching-Quench the tool in all air, or molten bath. To reduce a possibility of breakage and und distortion in intricately shaped tool it is advisable to quench in a molte bath at approximately 1100 deg. The tool may be quenched in oil a removed at approximately 1100 der F. The tool is then cooled in air is room temperature and tempered in mediately to avoid cracking.

Straightening-When straightening is necessary, it should be done after quenching and before cooling.

Tempering - Reheat slowly uniformly to 950-1100 deg. F. In general work 1050 deg. F. is me common. Hold at temperature least one hour. Two hours is a better safe minimum and four hours The time and tempera maximum. ture depend on the hardness a toughness required. Where tools are subjected to more or less shock, no tiple temperings are suggested.

Salt Baths - See report from O.P.M. Salt Bath Committee.

Furnaces—See report from O.P.M. Furnace Committee.

Coatings-Borax may be applied by lightly sprinkling over the steel when heated to a low temperature (1200-1400 deg. F.). Small tools heated as above may be rolled in box of borax. Another method more suitable for finished tools is to apply the borax or boric acid in the form of a supersaturated water solution In such cases the tools are immersed in the solution at 180-212 deg. F., a it may be applied with a brush.

Special protective coatings\* paints when properly applied have been found extremely useful. The do not fuse or run at the temperatures used and therefore do not affect

<sup>\*</sup> The trade names of these products that at

known at present are as follows:
No-Carb, Park Chemical Co., 8074 Million
Ave., Detroit, Mich.
Sel-Car, National Copper Paint Co., 1105
Dearborn St., Chicago, Ill.
Ferritol, E. F. Houghton, 3rd, American's
Somerset Sts., Philadelphia, Pa.

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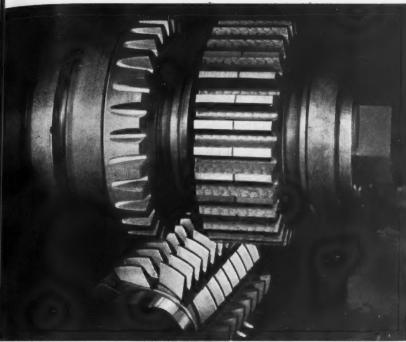
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## Like a Beaver Going Through a Sapling... $\label{eq:local_problem} \begin{tabular}{ll} Mature designed the beaver's teeth for extra strength and fast cutting . . . Barber-Colman engineers designed the special teeth of B-C Hi-Production Hobs with similar ideas in mind. The amazing speed and efficiency of the beaver cutting up a sapling for his dam is paralleled by the extraordinary cutting power of these B-C Hobs on production roughing jobs. \end{tabular}$

B-C Hi-PRODUCTION HOBS ROUGH

28 TRANSMISSION GEARS AN HOUR

tand cleverest workmen, see his highly developed as exceptionally effici-iting tools.

#### DATA ON THIS JOB

Port-High and third speed tractor transmission gear. Meterial - SAE 5145 steel,

Outside Diameter — 4.414". Depth of Cut - .321".

Holding Means - On arbor between centers. Heb - B-C Hi-Freduction 3" dis., 3½" long, 1½" hole, deuse thread, unground.

Mechine - G & E No. 12. Production - See text.

B-C Hi-Production Hobs have special teeth, designed for higher cutting sticking, greater cutting clearunes. See the second seed of the see

Four tractor transmission genrs, over 4' diameter and with \( \frac{3}{6}\) face, 29 teeth, 7 pitch, are loaded in facing pairs as shown. With a hob speed of 140 r.p.m. and a feed of .000' per revolution of work, cutting time for the load is only 5.2 min. Net production, allowing for loading time, hob changes, and operator efficiency, is 28 pieces per hour. Accuracy calls for .005' maximum runout on root diameter and .015" stock on the teeth for finishing. The hobs give 5 settings, 32 pieces per setting, and 160 pieces per grind.

#### SPECIAL TOOTH DESIGN GIVES GREATER CUTTING POWER

clearance on the leading sides of the teeth, and by using straight gashes and a positive rake for a shearing cut. Tests in comparison with con-rection of the comparison with con-greater production per unit of work-ing time, and from 10% to 25% less power consumed.



HI-PRODUCTION HOB

Usually made with double lead. When you ask for a quotation, be sure to specify the number of teeth in the gear to be hobbed.



STAMES INARE ENING MACHINES MILLING CUTTER!

## BARBER-COLMAN COMPANY

Januard Offices and Plant 207 Lauris Street, Rockford, Illinois, U. S. A.

the furnace hearth. When applying these coatings, it is necessary to have a surface free from scale or grease to insure good adherence. They may be sprayed or brushed on and usually one thin coat is sufficient. Heavy coats tend to pit the surface of the tool and in addition cause difficulty in its subsequent removal. Tools covered with these coatings should be allowed to dry before charging into the preheat furnace. After hardening and tempering the coating can be easily removed by light blasting with sand or steel shot. When tools are lightly ground, these coatings come off immediately.

Special Suggestions—As in the case of tungsten high speed steels, tools with sharp corners, variable cross-sections or very large sizes should not be given too drastic a quench in oil. It is better to remove the tool from the oil when cooled to or just below a red heat and allow it to cool in the air. Equalizing in lead or molten salt at about 1100 deg. F. and then cooling in still air is good practice.

Single point cutting tools, in general, should be hardened at the upper end of the temperature range as given in Table II. Slight grain coarsening on such tools is not objectionable when they are to be properly supported in service and not sub-

jected to chattering.

However, when such tools are use for intermittent cut, it is better to use the middle of the temperaturange. All other cutting tools see as drills, counter sinks, taps, milling cutters, reamers, broaches, for tools, etc., should be hardened in the middle of the range.

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Certain applications requiring a maximum toughness (to restate shocks) will require the lower end of the hardening range. Examples are slender taps, cold punches, blanking

and trimming dies.

The molybdenum high speed steels may be pack hardened following the same practice as used with tungsten high speed steels but keeping on the lower side of the hardening range (approximately 1850 deg. F.).

Molybdenum high speed steels will take all the special surface treatments including nitriding by immersion in molten cyanide that are applied to tungsten high speed steels

for certain applications.

When borax and boric acid are used in a furnace with a silicon-carbide bottom, it is necessary to use a metal pan preferably of stainless iron to prevent the borax from fusion produces a glass-like insoluble coating on the tool which is impossible to remove without damage to the cutting edge.

## 

#### The American's Creed

I believe in the United States of America as a Government of the people, by the people, for the people; whose just powers are derived from the consent of the governed; a democracy in a republic; a sovereign Nation of many sovereign States; a perfect union, one and inseparably established upon those principles of freedom, equality, justice and humanity for which American patriots sacrificed their lives and fortunes. I therefore believe it is my duty to my country to love it; to support its constitution; to obey its laws; to respect its flag, and to defend it against all enemies.

—William Tyler Page.

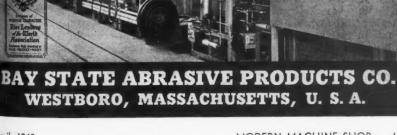
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## High Speed Setup for Abrasive Cutoff Machines

By WALTER G. PORTER

General Manager, Porter Machine Company

MANY shops that are bending their every effort to do their part in the National Defense Emergency have recently been putting to use the new method of bar-stock cutoff made possible by the abrasive cutoff machine. This machine, used a great many years in the stone-cutting industry, has recently come into its own in the more modern shops, both in the production and machine tool manufacturing plants.

As many people know, this cutoff machine utilizes the principle of a comparatively large diameter, thin faced abrasive wheel. The wheel is revolved at high speed while being fed into the stock to be severed, and the thin edge of the wheel grinds its way through the stock, making a fast, and in many cases a highly finished and very desirable type of cut.

The many manufacturers of abrasive products throughout the country have been experimenting for a great many years toward improving and developing various grades of cutoff wheels. These wheels have long been in use in tool rooms for the cutting of high speed steel and other materials too hard to be suitable for saw cutting.

There are, however, some shops where the abrasive cutoff method is employed quite extensively from a production standpoint. Many users have batteries of these machines to produce medium-sized cuts in tramendous quantities. However, it is a fact that the possibilities of the abrasive cutoff machine are not being used to as great an advantage at they could be since the cutoff operations that are usually performed arreally only a small portion of the work that can be handled by this method.

In any production plant where, for example, production might call for a great number of small, soft steed pins, such work generally is routed through the shop via the screw machine department where it is cut of at comparatively high speed.

However, many factories today are faced with a critical shortage of screw machine capacity. Some shops are so short of such machines that they are forced to sublet a large amount of their work to outside corcerns who are already swamped with work.

This problem was faced in our on shop, and in order to relieve the tremendous pressure of back-log order already booked for our limited some machine capacity, we tried to imple some simple, effective method of our ting off small, square end, straight round pins. Many thousands of the

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# TEST THIS NEW, FASTER COOLER GRINDING WHEEL

## PROVE TO YOURSELF IT WILL DO 2 TO 5 TIMES MORE WORK PER MAN PER MACHINE

It's hard to believe ... at first ... that by simply changing to a new kind of grinding wheel production can be stepped up 2 to 5 times. But it's true.

NEW PATENTED CONSTRUCTION. This wheel, called Por-os-way, is made by a new patented process. Look at the wheel carefully and you'll see that the structure resmbles a sponge . . . full of large air cells.

MACTICALLY ELIMINATES "BURNING."
The air cells cool each grinding point beween contacts. The wheel runs cool,

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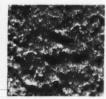
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Usual wheel, magnifed. Note the compact, "sandy" appearance.



Por-os-way structure, cellular, "stringy" like a sponge, but tough.

shows little or no tendency to burn the work even in the hands of an unskilled operator. This means you can take cuts far deeper than ever before, or your usual cut at a faster feed. Actual tests show an increase in production per man per machine of 100 to 400%.

FREE CUTTING. The Por-os-way wheel is amazingly free cutting because its porous structure reduces loading to a minimum. You can grind not only the hardest steels but softer materials such as copper, aluminum, wood, tin, rubber or plastics. The Por-os-way holds its corner and requires a minimum of dressing, due to the use of a tough new vitrified bond.

"PRESCRIPTION" FITTED. Por-os-way wheels are not stock wheels. They are made to order for your conditions of grinding. Write to us for a demonstration of this new wheel today. Let us prove to you that it is faster, cooler and free cutting on your job.

POR-OS-WAY

RADIAC\* PRODUCT

ASK FOR A DEMONSTRATION we had to make for aircraft universal-joints.

The pins were in various diameters and lengths from 1/8 to 1/2 inch diam-

DOUBLE Y-BELT PROM MOTOR PULLEY

WHEEL SPINDLE

B

TABLE

FLOOR TREADLE

FLOOR TREADLE

Detail Drawing of Abrasive Cutoff Machine Set Up for High Speed Cutting

eter by % to 7 inch in length. This was a very wide range of application for one abrasive cutoff machine, especially since the quantities involved ranged from 10,000 pieces of one size and length to 50,000 pieces of another size and length.

The larger parts, of course, presented no problem as far as handling was concerned. The smaller parts, such as the pin ½ inch diameter by ½ inch long, did present a two-fold problem; first, the handling of such small bar stock as ½ inch diameter and, second, removing the cutoff section of such short lengths as ¾ inch overall.

The conventional method of cutting the piece and then removing it by hand would, of course, be too slow and costly. In order to speed production we found that a very special type of stop and guides would have to be put on the machine itself so

that, when cutting the short % lengths, the stop used to determine the length could be removed and the small piece either pushed out of the road to make room for the next piece behind it, or the part could slide under the removable stop and down a chute into a catcheran.

It was intended that in longer lengths would be handled on the same machine, but since the largest pin was to have been ½ x 7 inch, this part would be entirely too large to readily adapt itself to the chute method of unloading after the part had been severed from the stock bar. Having determined this, we used the method whereby the finethod whereby the finethod whereby the finethod whereby the finethod whereby

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ished cutoff part would be shoved out from between the cutting wheel and the endstop.

The machine was then set up and the various guides and a special stop were installed. The drawing Fig. 1 shows the machine and parts as they appeared when ready for production cut off operations on the small round, straight pins. The machine is a new style small Delta Abrasive Cutoff Grinder.

The part A is the table top of the machine and is a heavily ribbed and reinforced casting accurately machined all over its top surface. The lever B operates the wheel-spindle housing and pivots the entire housing, containing the motor drive, about the pivot assembly—which is

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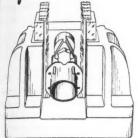
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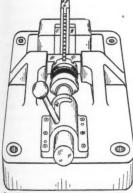
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Three passes of the broaches on a Colonial Senior press, and the flats on the cylinder flange of a radial engine are finished. The cam above the cylinder in the fixture centrols the infeed for each pass, Precision and output both better than by other methods.



Castellating nuts used to be a milling job. Here is a broaching setup that answered the demand for greater accuracy in special nuts. The output also turned out to be much greater than if the nuts were milled individually. It's another three-pass job to complete, and a Colonial Senior press is used.

#### AMONG OTHER COLONIAL JOBS AT

Broaching fuel pump drive gear.

Broaching splines in generator gear, oil
pump drive gear, seavenger pump gear,
oil strainer nipple, generator drive gear
support, etc. Broaching keyway in tachomter drive shaft gear. Burnishing such
parts as vacuum pump adapter bushing,
etc., etc.

R&F slotting of counterweights on a single Colonial Universal Horizontal in five operations with four broaches. A typical job-lot production setup.

## In Broaching you get both...

Some machines are bought for the accuracy to which they can machine, some for rapidity of metal removal. The reason there is such a demand for broaching machines and broaches today is that in broaching you get BOTH.

May we suggest that you start today to look over your present and projected production setup to determine how many machines you can eliminate from your requirements by broaching?

For job lots as well as mass production
—in a multitude of operations—broaching has
definitely established itself as the fastest and
most economical method of removing just the
right amount of stock in just the right places.
One Colonial standard broaching machine, for
instance, will frequently equal the daily output of several machines of another type to do
the same job, even though broaching may
have been adopted to meet more stringent
accuracy requirements.

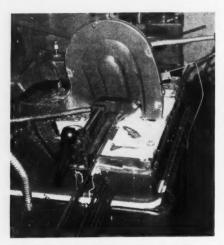
Scheduling your future broaching machine requirements now will help to insure getting them when you need them. There is a Colonial representative in your territory who will be glad to help you.

We will be gled also to put you on the mailing list to raceive "Broaching News" monthly. In it you will find varied examples of how broaching may be used to lower costs, increase production, and improve accuracy. A note on your company letterhoad suffices.

## COLONIAL BROACH CO.

147 JOS. CAMPAU

DETROIT, U.S.A.



Abrasive Cutoff Machine from Left Side

itself a very accurate Timken roller bearing assembly. A special counterbalance spring about the pivot shaft makes possible perfect balance, enabling the cutting wheel to be brought to bear on the work with finger tip control.

At C is a clearance slot in the table to permit the wheel to pass down below the surface of the tabletop. This slot is cast in the table and is wide enough to permit the thickest wheel to enter with a minimum of clearance at the sides. Thus the work is given a maximum of underneath support to prevent springing, which also guards against the

possibility of cutting off out-of-square.

The back guide, **D**, is standard equipment, and is mounted so that it is parallel to the centerline of the wheel-spindle. The bar being cut rests against this angle-iron guide while the cut-off operation is in process.

The guide marked **DD** to the left is also equipped with a special bar clamp which is not shown here to avoid confusion on the drawing. This clamp, however, acts against the bar, very close to the left side of the cutting wheel, making it possible to cut the stock bar up to the point where the remaining stock-end left over is not more than 3 inches in length. This compares favorably with the stock ends usually lost on screw machines.

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The guide marked **DD** to the right of the cutting wheel is identical with the left guide, except that a ½-inch hole is drilled through it at intervals of 2 inches along its length, at right angles to the wheel-spindle and perpendicular to the table top. These holes can be used for placing a stop, either the standard non-removable type furnished with the machine of the special stop which will be discussed later.

The guides E 1-2-3 are made of % inch hot rolled right angle stock cut to lengths to guide the stock being fed into the machine from the left.



## If it's STUD SETTING — It's our SPECIALTY

We can supply the proper tool for all sizes and types of stud setting—from 4-40 to 3" and larger if needed. Tools that are designed for small lots or large, for all standard and special types of studs, electric, pneumatic, machine tool or hand drive.

Send us a sample stud or sketch

for practical suggestions

TITAN TOOL COMPANY . FAIRVIEW, PA

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Red Ring Rotary Shaving finishes gear tooth surfaces accurately—faster than other methods and without producing any of those microscopic cracks in the tooth surface which are so hard to avoid with other gear finishing methods—and which are so prolific of fatigue failures in service. A Magnaflux test on shaved gircraft gears shows this conclusively.

This Patented Rotary Shaving Process which provides the Elliptoid Tooth Form has done more than any other one development to increase the service life of gears by eliminating end bearing.

Red Ring Shaving is an automatic process that is fast and economical. No skill is required in machine operation. It may, but need not, be followed by Red Ring Crossed Axes Lapping.



NATIONAL BROACH AND MACHINE CO RED RING PRODUCTS 5600 ST. JEAN · DETROIT, MICH.

SPECIALISTS ON SPUR AND HELICAL INVOLUTE GEAR PRACTICE

ORIGINATORS OF ROTARY SHAVING AND FLLIPTOID TOOTH FORMS

and serve as additional guides to steer the finished parts out of the machine to the right. E-1 is a straight and simple guide, set so that it gives only enough clearance to admit the stock bar being cut. E-2 is a short guide to prevent the small, short parts from being lost after they have been cut off. This guide steers the work under the removable stop and on out past the third guide E-3 from which point they can slide or fall from the table top into a waiting catch-pan. The third guide E-3 extends from the extremity of the table-top at the right along under the stop body, and up close behind the head of the adjusting stop screw I. This is necessary to make certain that the "train" of short parts will not buckle and thereby cause a jam.

The part F is the "stop body" which carries the stop pivot shaft. This part was made from 1 inch square soft cold rolled steel. One end

is turned and threaded to ½ inch and is shown mounted through one of the holes on the upright portion of the regular guide D.

Looking at the side view, it will be noticed that this body was mounted such that the necessary clearance " was maintained to permit the largest pin to pass under it while in the "train" on its way out of the m. chine. To effect this, the threaded portion was turned off center suff. ciently to provide the maximum clearance for height above the face of the table-top. A reamed and bushed hole was inserted at rick angles to the mounting stud and the entire part assembled to the machine so that this reamed hole was parallel to the top of the table surface. The stop-body was then dowelled in place to prevent its turning around the threaded portion.

The two collars G are of suitable size and are so made that they fil

## DESMOND TOOLS AND NIBS



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For over 35 years we have supplied leading industrial firms throughout the country. Advise your requirements and let us send you literature and prices.

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Just issued, lists and

describes the most complete sleeve

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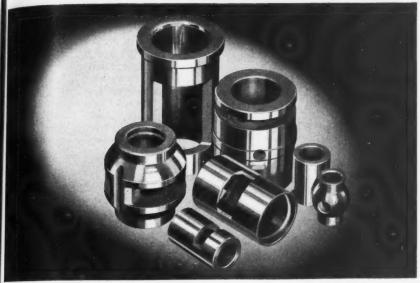
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## QUALITY is determined by PERFORMANCE

At no other time, in the history of our country, has it been so important to insist on QUALITY. The present continuous and uninterrupted operating schedules are placing unusual burdens on all types of machinery. Few items in your equipment carry such responsibility as the bearings. One faulty bearing can easily hold up an entire line of production. This is no time to experiment with unknown, untried, unproven products.

It is a simple matter to eliminate all risk when securing bearings. Specify JOHNSON BRONZE. For more than thirty years we have specialized on the production of QUALITY Sleeve bearings. Our experiences cover every known type . . . our facilities include every proven method.

facilities include every proven method.

The next time you purchase bearings, don't base your judgment on price alone. Check up on the alloy, the method of production, the experience and reputation of the manufacturer. Play safe and specify JOHNSON BRONZE.

## JOHNSON BRONZE

Sleeve BEARING HEADQUARTERS

590 S. MILL STREET · NEW CASTLE, PA.



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## The REID

All Electric
Automatic and Hand Feed
SURFACE GRINDER



The REID All Electric Surface Grinder is equipped with a motorized spindle, thereby eliminating all belts, pulleys, and counterweights. Table and cross slide are equipped with oil rollers, insuring greater life and proper lubrication. Table is operated with a silent chain instead of rack and pinion gears. Grinding capacity 6 x 18 x 11. Additional height if required on all standard machines. Send to Dept. E for descriptive literature.

**Exclusive Sales Agents** 

## H. LEACH MACHINERY CO

387 Charles St., Providence, R. I.

A Reid Distributor in Every Principal City

close over the pivot shaft, where they are set by means of set-screws with a minimum of clearance against the two sides of the stop-body. This maintains the horizontal position of the pivot shaft with respect to the stop-body mounting.

The bellcrank lever H is the pertion of the stop assembly which carries the stop-screw itself. It was made from a piece of steel % inch



Right Side of Machine as Set Up for High Speed Cutting

wide by ½ inch thick and of a length suitable to permit the stop screw to come into correct angular alignment with respect to any sizes of stock which may be cut off on this machine. At one end the bellcrank lever is drilled and reamed for a ½-inch hole. Through this hole the end of the pivot shaft is inserted and properly held fast both for horizontal and angular position on the pivot shaft by a locking setscrew.

The opposite end of the bellcrant shaft is drilled and tapped to admit the threaded portion of the stop-

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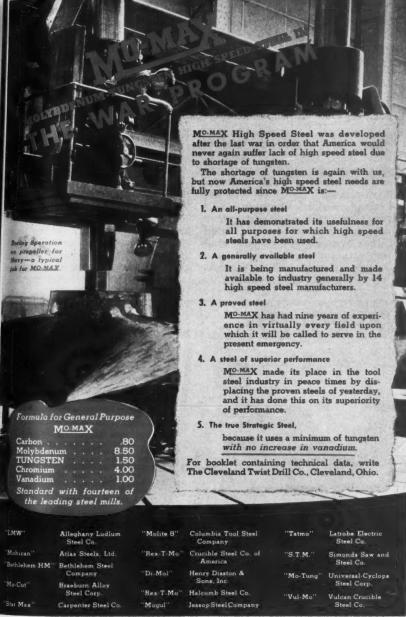
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screw itself. A tapped cross hole, in line with the stop-screw hole, carries a setscrew and a brass plug. The setscrew serves to secure the stop-screw after it has been adjusted to give the proper desired length of cut-off to the work. The brass plug bearing against the threads of the stop-screw prevent marring or upsetting those threads when the locking screw is pulled down tight to secure the position of the stop-screw in the bell-crank body.

The stop-screw itself is indicated at I. Due to the particular application on this setup, a special & 18-thread screw with a very large diameter head was made. The head was flat and about % inch diameter. This was necessary to provide a maximum of area for the work bar when that work bar was pushed against it prior to the cutting-off operation.

The lever J acts as a counterpart to the bellcrank which carries the

stop-screw, and consists of a piece of flat stock about  $\frac{3}{8}$  x  $\frac{1}{2}$  x 6 inches he length. One end is drilled and reamed to permit sliding over the pivot shaft. This end is cross-drilled to permit tapping a setscrew hole which, do course, locks the lever in any convenient horizontal and angular position. The underside closest to the table top was "spotted out" to act at a socket for a compression spring. The table top was also spotted for the same purpose.

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The compression spring L is to enable the end-stop to turn back to its stop position to establish the length of the next piece to be cut off. This spring need not be very powerful; any small compression spring capable of holding the end-stop screw down against the table top is sufficient. In addition to this, the top portion of the lever arm was drilled and tapped so that two capscrews could be inserted for the purpose of

IMPROVED! Mastercraft Turret Tool Post Always A Superior Tool ... Now Greatly Improved Faster action for top production-Hardened throughout, for longer service — Self compensating for wear in hard use — Precision built for accuracy. The new Mastercraft Turret is a fast indexing 4-way tool post for repeat operations on the engine lathe or for front cross slide on the screw machine. Especially designed for use on 9" and 10" South Bend Lathes, Sheldon, Clausing, Allas, Logan and similar bench lathes and small screw machines. Order through your jobber or write for literature. CO. · Hollywood, California Selling a n d

Close-Up of Machine in Operation

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holding the balance of the lever assembly.

The outer portion of the lever arm assembly K consists of a piece of ½ by ½ inch wide fat spring steel. The end is secured to the body portion of the

lever arm J by means of two capsrews. The length of the lever arm is, of course, dependent on the length found necessary to overhang the front part of the table-top. The overhang is necessary to permit fastening a foot-operated treadle rod so that the operator can operate the entire end-stop assembly with his foot, thereby leaving free his two hands, one with which to feed the bar stock into the machine from the left, and the other to operate the cut-off wheel by means of its control lever

The end of the spring steel lever arm is curled to a hook shape to carry the treadle rod M. This treadle rod consists simply of a piece of  $n_0$  inch round steel rod bent and fastened to the end of the spring-steel lever arm K by means of a cotter-



key.

The treadle N is a piece of flat stock fastened to the floor by the hinge O. The shaft P is the pivot shaft upon which the entire stop assembly turns as it is actuated by the operators foot in one direction, and by the compression spring in the return direction.

It is necessary to have the stock guides **D** parallel to the spindle centerline and perpendicular to the cutoff wheel. Also it is necessary to locate the front guides **E1-E2** and **E3** close to the bar passing through the machine. This enables the operator to easily work fast with no danger of the stock bar getting away from the back guides and permitting the cuts to be made out of square.

The next step is to see that the end stop screw and its body and as-



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GEO. T. SCHMIDT, Inc. 1806 BELLE PLAINE AVE. CHICAGO, ILLINOIS sembly are placed in a convenient mounting hole in the back upright portion of the guide **D** to the right of the cut-off wheel. The stop screw itself can then be adjusted to the desired distance from the side of the cut-off wheel.

The lever arm J-K should be adjusted to a position such that whe the foot treadle is down against be floor, there will be sufficient row UNDER the head of the stop screto permit the cut off parts to alloclear. When the treadle is release the stop screw head will block hexit passage sufficiently to permit easy establishment of the length of the next piece of work to be cut of

Operation would be roughly alo these lines. First, permit the fe treadle to come up away from t floor and thereby bring the stop in position. The stock bar is then s against the stop screw, and by hi ing the bar securely with the l hand (far to the left of the table to the cut-off wheel can be pulled do through the work bar. Upon releas ing the wheel head, it will fall up ward away from the table and practically the same instant the right foot presses the treadle and the en stop screw is pulled up away from the table top sufficiently to permi the cutoff to be pushed underneath and in the clear to the right. A good fast man who can coordinate his mo tions will "knock" the cutoff piece far enough to the right of the sto screw so that by the time he has sil the work bar up to the stop screen again, the stop will be in its correct position to establish the length of the next piece.

On the jobs on which we used the fixture, we were able to obtain a average 8-hour production amount to 5,000 pieces. This was done had ing a plus or minus tolerance 0.005 inch on the lengths of the part being cut off.

MODERN MACHINE SHOP

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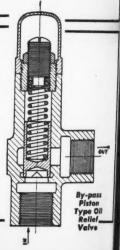
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#### Adjustable Taper Boring Bar

By FRED PAULSON

THE drawing and photograph herewith illustrate a taper boring bar that I made in the Grand Trunk locomotive shops at Battle Creek, Michigan, for use in boring locomotive crossheads. Previous to making this bar, all new and welded locomotive crossheads had been bored on a turret machine upon which it was difficult to obtain an accurate taper both because the operator had to move the turret to machine the taper, and because it was a hard job to keep set up on the center line. With the attachment shown, set up on a horizontal boring machine, the time has

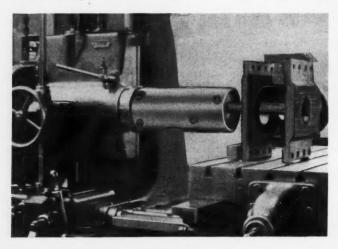
been cut in half for the operation an accurate job is produced. All spindle feeds and speeds are availator use, and the spindle is used control the taper.

The principal parts of the tool the housing **D** and the boring by the two parts revolving simultiously while the bar is fed through workpiece at an angle, thus proving a taper hole.

The housing is made from a stion of 8½-inch diameter steel the to which a bolting head is welded that the housing can be bolted to head on the machine. Slots a holes were machined in the hous to lessen the weight and provide cess to the feeder pin on the instantial to the state of the state

With the hing bolted to machine head, boring bar is tached to the spindle by many of the any piece A, with drives against flat on the feet pin B. As is

at a time



Adjustable Tapel ing Tool Set Up Horizontal Best Mackine

April,

MARVEL SAWS handle orders as they come, at Jones & Laughlin Warehouse

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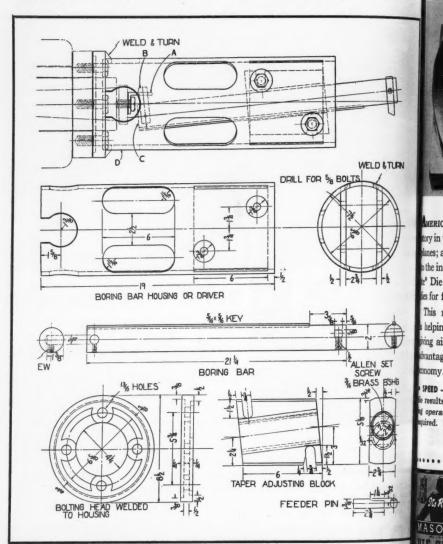
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spindle is fed forward, it bears against the end of the boring bar and feeds it forward also, the thrust being taken by the head of a case-hardened screw in a stub arbor.

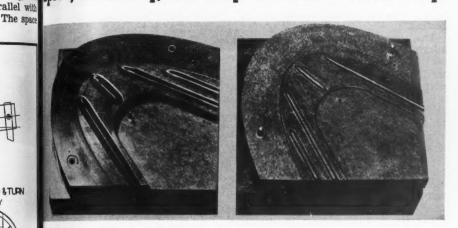
Inside the housing, near the front end, are welded two steel plates each ½ inch thick by 6 inches long the plates being positioned parallel with 2% inch of space between. The space

Spe



Drawing Showing Details of Adjustable Taper Boring Tool

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between the plates provides for the taper adjusting block in which the boring bar operates, the block serving to guide the bar and to provide adjustment according to the taper desired.

The taper adjusting block is also 6 inches long, is 51/8 inches high, and is 2% inch thick less a couple of thousandths-just enough to provide a push fit between the steel plates. The block is held in the housing by bolts passing through holes in the sides of the housing and through slots in the upper left and lower right hand corners of the block, as shown. Extending lengthwise through the adjusting block is a brass bushing, 2% inch outside diameter and with a 16 inch wall, which serves as a bearing for the boring bar. A 16 inch key prevents the bar from turning in the bushing.

A square hole through the boring bar near the end provides for a % inch square toolbit, a ½-inch Allen (headless) setscrew being provided to lock the toolbit in position.

When setting the tool preparatory to boring a taper hole, the angle of the taper is figured and the bar is set accordingly, or the bar is set at the approximate angle and gauged with a bevel protractor, adjustment being made to obtain the correct angle of taper. Adjustment is possible up to the limits provided by the depths of the two slots in the corners

of the adjusting block through which the locking bolts pass, the depth of the slots being limited by the diameter of the bushing through which the bar passes.

#### Bonus Plan Saves on Small Tool Breakage

By EDWARD E. FELTER

ONE of the results of the all-ondefense effort is that small toodefense one—are becoming more valuable day by day, and it behooves ever one, therefore, to save such tools in the elimination of breakage and day age. We all know that carelesses is responsible for at least 50 per coof the damage to small tools, so the problem becomes one of eliminating carelessness on the part of those when use the tools.

In our shop a system has be inaugurated whereby those who we these tools are given an opportunit to earn a bonus, the amount depending upon the amount of saving the is made over the year on small to costs.

Taking the cost of small tool replacements over a period of years, a average is set up for the cost of sucreplacements. From this amout about one-half is deducted as beindue to normal tear and wear. To



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MODERN MACHINE SHOP

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other half is split between the company and the men; thus one-fourth of the total amount spent per year for small tools replacements is set up as a bonus and the men are notified that this amount is to be divided at the end of the year among the employees in the department—less the cost of broken drills, taps, and the other small tools that are used in this department.

As broken tools are returned to the crib, each item is added to a list that carries the name of the tool, the name of the man breaking it, and the amount that is to come out of the jack-pot to cover the cost of replacement. This list is posted on the tool-

crib where all may see it.

During the first month after this system was put into effect not a single small tool was broken in use.

#### Welded Test Jack Speeds Weld Tests

By A. F. Davis
Vice President, The Lincoln Electric Company

THE training of hundreds of new welding operators throughout the country to meet war demands has made it necessary to test the work of newly-trained welders faster than ever before and at the same time more carefully. To speed tests of welds, technicians at the B. H. Leonard Welding School of St. Louis, Missouri, and the Midwest Piping and Supply Company, designed the all-welded test jack shown herewith.

The device, a front view of which is shown in the illustration, consists of a sturdy frame built around a hand-operated hydraulic jack. It is used for making free-bend, side-bend, and back-bend tests on weld coupons. The organization uses it as standard equipment for testing arc welding operators on field construction jobs.

The design, which was arc weld with equipment supplied by The Li coln Electric Company, Clevelan Ohio, was made from scrap pieces steel. According to B. H. Leona owner of the welding school and s



Sturdy Welded Test Jack Used in Testing Bend, Back-Bend and Free-Bend Welds Testing of Arc Welding Operators a Construction Jobs

pervisor of welding at the Miconcern, the project was an appensive, fast-fabricating job wirequired a minimum of machining

The hydraulic jack used is rate eight tons, so the frame had to sturdy to stand the strain. In illustration the male member of guide-bend die may be seen foot the %-inch thick standard test pon into the female side of the o

Midwest engineers calculate the weld strength of the frame per cent, as compared to 80 per in other types of construction.

The side and top members of degrees, we frame were made of mild steel inches wide and ½-inch thick.

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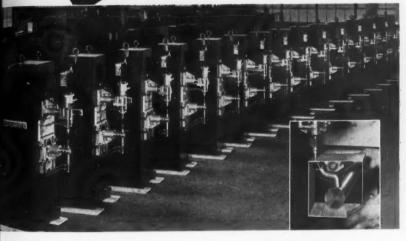
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PEDESTAL TYPE

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ESPITE peak production levels and peak demand for welding equipment, Progressive has been able mintain, so far, an average delivery time of only of weeks on complete pedestal type spot welders, by for use. Quantity production—and production ad of orders, as far as possible—is the only way in ith this could be done.

Moreover, while these pedestal welders—in capacifrom 35 to 200 KVA have been in regular produc-A numerous improvements have been incorporated being the availability of a new and improved shunt of head. This head is also available, if desired with stachment permitting its being swiveled a total of degrees, while the lower arm may also be obtained à a rotatable construction. These special features mit clearing of obstructions and welding at various ths, in corners, etc.

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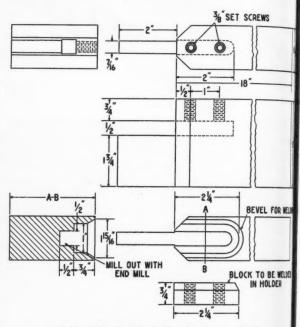
side pieces are approximately 2 feet long and the top members 9 inches. The bottom base plate is 9 inches square and 1 inch thick.

The male member of the die is 11/2 inches by 2 inches by 6 inches. The upper end was machined on a 34-inch

radius and the lower end welded to the upper surface of the jack. The female part of the die also was 2 inches thick and its curved portion was machined on a 13/13-inch ra-The lower dius. corners of the female portion of the dies were rounded off as There shown. were no holes to drill or punch and the parts did not have to fit accurately at the ends, permitting the use of scrap material. The school used one of their 30 Lincoln welders on this job.

To make parting tools for our lan planers we were using 1 x 21/4 x inch high speed steel bar stock, form to size and shape. These tools we used to machine T-slots in lan steel plates.

We found that by making a to



Design of Toolholder to Use Toolbits for Slotting

#### Toolholder Saves High Speed Steel

By A. W. PAYNE

URING these times when high speed steel is at a premium it is very necessary that all users of high speed tools economize wherever possible in order to conserve the available supply. To this end the toolholder presented in the drawing was designed.

holder of the type shown, we w able to use toolbits and, further, the these tools worked just as well the forged tools previously used i Several of the operation. holders were made from word patented toolholders. They can made to take any size of toolbit in ½ inch to ¾ inch, and will w successfully in either plate or steel. The method of construct saves what would otherwise be a d siderable amount of hard work ing or broaching square holes in solid steel to take the toolbits.

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TO BE WELDED HOLDER

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April, 19 April, 1942

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## Pointers for Reducing Late RC Accidents

By ERNEST W. FAIR

THE shop executive who makes definite effort to reduce the number of accidents occurring in late operation will find that he has earns several rewards. There is less spot age of work, machines have longer life and maintenance costs are lower in addition to less personal injury to operators. Below are several suggestions for accomplishing the results.

(1) Accidents frequently occur when a tool becomes loose in the topost. When setting a tool be sure to clamp it lightly until it is set in the correct position and then thread the clamping screws down tight.

(2) Bolts holding the compount rest from swiveling should be checked frequently to see that they have not become loose due to vibration of the machine. If these bolt become loose, the compound will swing around, owing to the pressur of the cutting tool on the work, and considerable damage to the work of machine will result.

(3) Chuck jaws should be checked and double checked to make sure the they are adjusted properly before the machine is started.

(4) The carriage should never be run against the faceplate or chuck it may damage the lathe badly.

(5) Always keep the tailstock on ter well lubricated. White lead a oil makes a good center lubricant

(6) Never feed the tool toward in tailstock unless absolutely necessary and then take only light cuts. In pressure of the tool against the wind throws a heavy load on the tailstocenter and since the center is stationary and the work is turning on a great amount of friction is set in

(7) Before attempting to chase thread, the clutch lever that control

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many years, though we are shipping far more testers each week than ever before.

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the feed mechanism should be placed in the neutral position.

(8) Oil the lathe frequently and thoroughly and never overlook the many holes—though they may be difficult to find. When oiling, follow one rule; look for an oil hole wherever there is a moving part.

(9) Leadscrew and crossfeed screws must be oiled not only on the bearings but on the threads themselves.

(10) Never drop or lay any work or tools on the lathe bed.

(11) Do not hammer directly or indirectly on the ways.

(12) Smooth down any nicks that may occur on the lathe bed; don't allow them to stay unsmoothed.

(13) Check the lathe bed regularly; be sure that it remains level.

(14) Always be sure that the shoulder and threads are clean and well oiled before threading on a face-plate or chuck.

(15) Always seek to avoid burning threads or shoulder.

(16) Do not run a chuck or tas plate up the shoulder suddenly. To will strain the spindle and threat and make removal extremely difficil

(17) Use a smooth flat file to move any bumps on the shoulder as a smooth three-cornered file on a threads.

(18) Do not attempt to force jar into the wrong slots. Be sure to the number on the jaw correspond with the number on the body below the slot.

(19) Make sure that the three and shoulder of the faceplate are in from dirt and are well oiled.

(20) Do not apply the power unit you have revolved the spindle hand.

(21) Watch your fingers; particularly keep them from getting cause between the work and the tool or exposed gearing.



The standards of excellence which govern ever operation in the manufacture of "America Swiss" Swiss-Pattern Files require a craftsmaship that is learned only through long years of experience. This old-timer, engaged in "stripping" file blanks, has the responsibility of finishing the smooth, even surface that is necessar to form sharp teeth of uniform height. He, and every other "American Swiss" mechanic knows that perfect results in his own operation is essential to the final perfection demanded for each finished "American Swiss" file. This one of the reasons why these precision tool are preferred by tool and die makers all on the country.



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Adjustable Boring Blocks and Bars

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WHEN the defense job you are tooling includes holes to be bored with extreme accuracy, investigate the advantages of the McCrosky Centralizing-V Lock. It centers the Adjustable Block in the bar with extreme accuracy and also provides close control of the amount of block float for the finishing cut. And it permits blocks to be inter-changed without removing the centering key from the bar. . . . For complete details ask for McCrosky Bulletin 15-B.

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SUPER ADJUSTABLE REAMERS

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SPECIAL PURPOSE TOOLS
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The Average Crane-Not Properly Guarded

(22) Be sure to remove the wrench from the chuck before starting up the machine.

(23) Watch clothing. Many accidents occur when clothing is caught in the work or lathe dog.

(24) Do not use an ordinary screw driver to remove a machine screw.

## The SPRINGFIELD CIRCLE CUTTER



For cutting cardboard, print paper, leather, celluloid, rubber, asbestos, felt, cork, fibre, cloth and glass. Any size up to 14".

Measuring scale determines sizes. Clamp holds work in place. Double knives complete gasket at one setting. Cuts square edge or bevel edge. Write for complete details.

#### THE SHAWVER CO.

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#### Safety Suggestions for Electric Crane Operation

By R. A. SHAW

**B**ELOW are a number of suggestions which should be found useful for safe electric crane operation:

 The average machine shop building has little clearance at the end of cranes. This should be increased.

Walk ways should be provided with a 6-inch toe board. The average crane has none.

3. The driveshaft which revolve near the walk should be covered. Or 90 per cent of operating cranes to day, this shaft is open.

4. Wheel wipers for rails should be attached in front of all wheels to keep the tracks clear of obstructions.

5. All trolleys should have protective shields of fiber board to prevent the hoist cables from swinging against them and burning cables and annealing the wires. Wires which have been thus annealed easily break

6. A tool and oil box should be part of the crane to keep all bearing grease from grit, also so that tool can be kept in a safe place, thus preventing them from falling.

7. Ladders (band around) should be a country to the country around balcony with clearance of

#### TEST YOUR KNOWLEDGE RN" DI

HERE are 12 questions about "Acorn" Dies. Out of 7 tool foremen who recently tackled them, only one was able to score 100%. How about you? Don't peek at the answers in the lower right corner till you've checked your knowledge. 1. "Acorn" Dies can be used on all makes of hand or automatic

screw machines, turret lathes, bolt cutters, drill presses, etc. Right Wrong

2. "Acorn" Dies can only be used on fixed centers. ☐ Right ☐ Wrong

3. "Acorn" Dies are adjustable. ☐ Right ☐ Wrong

4. "Acorn" Dies do not require lead screws on machines on which they are used. Right Wrong

5. "Acorn" Dies can be used on any machines which reverse either the die or rod when the desired thread length has been cut.

☐ Right ☐ Wrong 6. There is only one size of "Acorn" Die blank for all thread sizes. ☐ Right ☐ Wrong

7. There are standard holders which permit "Acorn" Dies to be used with "button," spring or floating die holders

☐ Right ☐ Wrong 8. Smaller than ordinary "Acorn" Dies can be used with a given

☐ Right ☐ Wrong holder. 9. Each size of "Acorn" Die holder is available with only one size ☐ Right ☐ Wrong shank.

10. Genuine "Acorn" Dies have an exclusive patented "heel" on the cutting lands that prevents tearing threads on reversal.

☐ Right ☐ Wrong 11. "Acorn" Dies are so uniform in size that they can be removed for sharpening, or changed without checking machine set-up.

☐ Right ☐ Wrong 12. A special fixture is needed to hold dies for sharpening

☐ Right ☐ Wrong



Acorn" Die



"Acorn" Die Adapter, for button, spring or floating holders.

For years "Acorn" Dies have hung up amazing records on various types of pro-duction work. Consider them for any job where dies seem to wear out rapidly.

#### GREENFIELD, MASSACHUSETTS

DETROIT PLANT: 2102 West Fort St.

WAREHOUSES in New York, Chicago and Los Angeles In Canada: GREENFIELD TAP AND DIE CORP.
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GREENFIELD TAP AND DIE CORPORATION

advertisements published by Greenfield Tap & Die Corporation to help users get greater production from their small tools in these critical times, through making use-. ful facts more widely known

4. Right 12, Wrong 8. Right II. Right 7. Right 3, Right 6. Wrong 2. Wrong 10. Right 5. Right L. Right 9. Wrong

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## INFINITE VARIABLE SPEEDS WITH CONSTANT SPEED MOTORS

WITH LO AUTOMATIC PULLEYS



HI-LO Pulleys maintain constant speed at any set point and automatically regulate belt tension to load. Load is carried by cams which ride on tracks in end bells. Springs keep pulley faces up against belt at all times.

HI-LO Pulleys are easily installed on any machine and will handle drives from fractional up to 5 h.p.

Write for folder which gives sizes and prices and formulae for determining proper size pulleys.

EQUIPMENT ENGINEERING CO.

inches between any part of balcon and cab of crane.

- 8. The electric feeders should be marked and protected so that the coloperator cannot touch them.
- All electric parts, including all contacts, should be covered, especially all feeders leading into contaboxes.
- 10. A locking handle should be provided on each switch in the cab s that it can be locked when work inspection is going on about the crane.
- 11. The operator should understand all rules, must sign and carry his nibook permit, and must be examined yearly to assure physical fitness.
- 12. It should be especially understood that no one is to work near a upon the tracks of the crane runway without first notifying the operator, who in turn will place a bumper at the track between the workman and the operating side runway.
- 13. Good housekeeping on the crushould be the rule. The personal proof the operator in his equipment is very important factor in establishing a good record.

Shakeproof Products Catalog No. 4. An unusually complete fastening data catalog is now being published by Shakeproof Inc., 2501 N. Keeler Am. Chicago, Ill., giving full technical is formation on Shakeproof Products. Il 140 pages contain detailed explanation of the many different Shakeproof is ening devices, such as lock washer thread-cutting screws, SEMS fastent units, spring washers, locking and paterminals, locking screws, and initial precision stampings. Besides thorough the control of the catalog shows many application suggestions for saving the and improving fastening performance. A special section is devoted to given ment specifications and approvals.

Copies of Catalog No. 42 are available to officials of metalworking industrial addressing a request on their compa

letterhead.

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April,



LONG DIES ... THIN SECTIONS. A TOUGH BLANKING JOB...BUT

ATE IT UP



routine—movement is nil—trouble stays safely away. (Say "AIR HARD" to the VASCO man, and let him show you the difference!)

Steel Co. Latrobe.pa.





## **GEOMETRI**

## ... BETTER THREADING TOOLS ... FOR BETTER THREADS!

Specify Geometric if you want rigid chaser support; for accurate adjustments; positive, dependable opening and closing action; tools built by precision methods for the finest steels.

- . . . We have specialized for forty years . . .
- . . . Spent thousands of dollars in research . .
- . . . Our tools are . . . Easy to Operate . . .
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You can count on them for greater operating convenience and freedom from trouble.

#### GEOMETRIC

Self-opening Die Heads
Collapsing Taps
Solid Adjustable Die Heads and Taps
Chaser Grinders
Grinding Features

Threading Machines



### THE GEOMETRIC TOOL CO.

NEW HAVEN, CONN.

Compensate for TOOL WEAR and UNEQUAL TOOL LENGTHS on single and multiple spindle jobs with MIDWEST ADJUSTABLE EXTENSION HOLDERS

MIDWEST ADJUSTABLE EXTENSION TOOL HOLDERS in use for FINISH REAMING Operation as Cylinder Blocks in a Detroit Automotive Plant

- ADJUSTMENTS CAN BE MADE IN STEPS OF .001 OF AN INCH.
- OPERATOR CAN MAKE ADJUSTMENTS BY HAND— NO TOOLS NEEDED.
- SET-UP TIME IS REDUCED.
- DESIGN IS SIMPLE, CONSTRUCTION RUGGED.
   ALIGNMENT ACCURATE.

#### HERE'S HOW THEY WORK

Midwest holders are provided with an extremely accurate, ground fit between the sleeve and the shank. A knurled, graduated collar which controls the adjustment is located at the top of the sleeve. A key fixed in the sleeve, with a sliding fit to a keyway in the shank provide a positive drive.

Micrometer, longitudinal adjustment steps of .001 of an inch are made by turning the collar one space on the bevelled edge, graduated scale. The collar holds firmly at all positions of the scale. There are no screws or locknuts to give trouble and, without tools of any kind, the operator can easily make the adjustment by hand.

MIDWEST TOOL & MFG. CO. . 2366 W. Jefferson . Detroit, Mich.

END MILLS • SLEEVES • COUNTERBORES • DRILLS SPECIAL TOOLS • REAMERS • FORM TOOLS CARBIDE TIPPED TOOLS • ADJUSTABLE HOLDERS

Precision METAL CUTTING TOOLS



April, Maril, 1942

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MODERN MACHINE SHOP

205

### Modern Equipment at Work

## Complicated Soldering Done Automatically

AN automobile radiator looks like an intricate maze of copper tubes and fins—requiring a countless number of soldered joints. This complicated soldering job is now done automatically instead of by hand. The assembly of copper tubes, fins, and solder are placed in position on this electrically-operated conveyor in the plant of the Fedders Manufacturing Company of Owasso, Michigan, and the conveyor, a product of Mechanical Handling Systems, Detroit, then takes over the job.

First the assembly passes through a flux spray, and then on into an oven. The oven-heating cycle is operated in synchronism with the conveyor movement, using electrical controls developed by the Westinghous Electric and Manufacturing Company.

After a fixed time in the oven, long enough to bring the solder to a find point, the conveyor starts again and moves the radiator core into a present where it is held flat and square which an air blast cooks it and soliding the solder. This air blast is also automatically synchronized with the coveyor and press movement. After the ore is sufficiently cooled, the press opens and places the core again on the conveyor, which delivers the finished core at the discharge end.

The entire operation of the oven automatic, likewise the operation of the press, and both are controlled a sequence with the intermittent ment of the conveyor. This show very well what can be done in the way of developing an automatic space of the process machinery when

several open tions are tied to gether by a har dling system thereby making a large automad machine out of several manual operated ones.

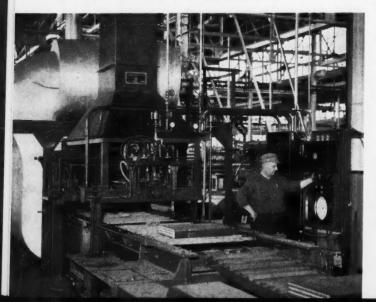


Fig. 1—The Hundri of Soldered Joint an Automobile Bait tor are Made in it Oven and Electrical Operated Couvery System Using Esca Controls Built by it Westinghouse Esca & Manufacturing ork Jinger TROL. Speeds Production

RACINE

HEAVY DUTY HYDRAULIC METAL CUTTING MACHINES

Ease of handling saves real time in Tool and Die Cutting and RACINE Hydraulic saws do just that!



Speed Change Control . . . Single lever controls three speed transmission for cutting all types of steel.

Single Dial Controls pressure and feed. Sensitive, accurate control of cutting from thinnest walled tubing to toughest tool steel and die blocks.

Single Lever All Front Control governs rapid traverse up and down, clutch engagement and rest positions, all operating phases of the machine.

RACINE modern hydraulic saws,  $6 \times 6$ ,  $10 \times 10$ , up to  $14 \times 20$ , are unequaled in the cutting of bar stock-structurals-die blocks -in steel mills-shipyard and production plants-wherever metal cutting jobs are tough. Send for information today.

RACINE TOOL AND MACHINE COMPANY

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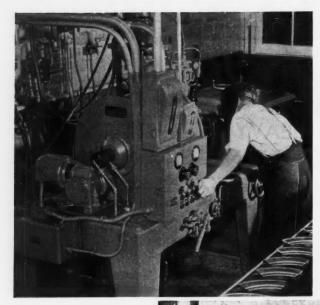
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A General Electric Cutom-Built Atomic Byths gen Welding Machine Buse for Welding Bre Gun Magazines Magazines Several Magazines Lower Right Foregram

neers, working with the engineers of the munitions plant.

In the origin Bren gun factory at Brno, Czechoslovakia, this task was accomplished by hand welders, workblanks ing at benches. British manufacturers developed a method however, by which

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#### **Atomic Hydrogen** Welder Aids Defense

RODUCTION of Bren gun magazines in a Canadian munitions plant has substantially been speeded since the recent installation of two General Electric Atomic Hydrogen Welding Machines. These machines were custombuilt for the precision welding of these vital parts by G-E engi-



View of G-E Atomic Hydro-gen Welder in Operation

Electric Cus Atomic Hydro ng Machine in elding "Bren azines. Magazines in ht Foreground

rking with eers of the plant. e original factory at zechoslovatask wal ished by

ches. Brita method by which



By making your own KENNAMETAL TOOLS

KENNAMETAL tool blanks are shipped in 2 to 5 days after receipt of your order. That means you can have the advantage of KENNAMETAL quickly if you order these ders, work blanks and braze your own tools.

### ches. Brit It's easy to make KENNAMETAL TOOLS in your shop

It isn't always necessary even to mill a pocket for the KENNA-METAL tip. Contrary to popular impression the side wall on the recess of a tipped tool is unnecessary, and eliminating it avoids brazing, their required by receiving the ing strain caused by warping. In such cases simply shape or grind off an open shank:



and braze the tip in like this:



NOTE: It is possible to save time and steel as well by re-tipping your old tools. Just saw off the shanks and braze on new KENNAMETAL TIPS.

#### If You Follow Simple Instructions in our Vest Pocket Manual

You need only standard tool room equipment, plus a torch or a brazing furnace, to make your own KENNAMETAL steel cutting carbide tools. First step is to mill a pocket in the steel shank or simply shape or grind a step as shown at left. Then, using Tobin bronze or Ezy Flo, braze in the KENNAMETAL tip, and after it has "set," grind the clearance angles. Complete, easy to follow instructions are included in KENNAMETAL Catalog 42, or write for our new vest pocket manual for KENNAMETAL users.

SALES REPRESENTATIVES FROM COAST TO COAST



300 LLOYD AVE., LATROBE, PA.

Foreign Sales: U.S. STEEL EXPORT CO., 30 Church St., New York





Close-Up View of Welding Head

the outside seams of five magazines were automatically welded at one time after the five magazines had

been clamped in a fixture. The may azines were then placed in anoth fixture for welding the inside sear individually.

The General Electric machines partial welding of both sides of the magazines in one fixture at one operation effecting an important saving in impact and cost.

"Grits and Grinds," Vol. 32, Ne. is "Balanced Grinding Wheels Produced Better Work" is the lead article for in particular edition of "Grits as Grinds," technical house organ of Norton Company, Worcester, Mass. In lowing this interesting article is a shiften illustrating and describing a headuty profile grinder. The center spraof the booklet presents a few help hints on what to do and what not do in order to get the most out grinding wheels.

grinding wheels.
"What Is Lapping" and "Out of the Past"—an article on the beginning Bakelite resinoid as a grinding who bond—are other features of intercontained in the booklet, copy of which is available free upon request.

## THE CENTER OF ATTRACTION

Economical Live Ball and Roller Bearing Centers are going to play an important part in our defense program. For LATHES, HAN SCREW MACHINE GRINDERS and MILLS.



- 1. Simplicity, sturdiness, and heavy duty.
- 50% more radial load carrying capacity than the average live center.
- Large spindle, small head, short overhang most desirable for rigidity and to be free from chatter.
- With aid of cap screw you can lock spin dle to redress point right in your machine
- Special oil seal to retain lubricant and keep out foreign matter.
- A compression pad to compensate for beating and expansion of metal as a salely factor, with reasonable diligence exercised.

A folder giving prices and complete details will be mailed to you upon request.

A ten-day trial. If not perfectly satisfied, your money will be cheerfully refunded

MOTOR TOOL MFG. CO. 12282 TURNER AVE. DETROIT, MICHIGAN

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April, 1942 April, 1942



- TORQ-QUA-MATIC drives avoid losses thru belt slippage, and breakdowns associated with overhead shafting.
  - 2 Convenient location of speed selector reduces operator fatigue,—increasing his production.
    - 3 Delivers greater torque capacity at the output shaft than is ordinarily obtainable. Makes lazy tools work.
      - Permits installation of additional machinery in odd spots; adds flexibility to shop layout.

for lathes, shapers, millers, punch presses, etc.

PROMPT DELIVERY - ORDER NOW!

TORQ ELECTRIC MFG. COMPANY

MODERN MACHINE SHOP

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MANUFACTURING CO 1500 North Lafayette Street VALPARAISO, INDIANA

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April, if April, 194

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JOHN BATH & COMPANY

WORCESTER, MASSACHUSETTS, U. S. A.

April, Il April, 1942

MODERN MACHINE SHOP 213



#### Backbone - or Wishbone?

THE old adage "He who laughs last laughs best" is still good; the trick is to get the last laugh. So far in this war—beginning with Pearl Harbor—the laugh has been on America and its allies. We knew for months in advance that war with Japan was imminent, but we wished so hard for peace that we did nothing about it until the Japs woke us up with bombs. Then we "wished" a short war because some mis-guided naval experts assured us that our navy could dispose of the Jap navy in two weeks, and up to the present moment our navy has taken a beating. And we are still wishing.

We have been told that Japan couldn't hold out for a long war; that their stocks of oil and copper and steel and other vital materials would shortly be dissipated and then the war would be over. But we learn now that Japan has been buying oil for many years and storing it in underground tanks against the day when the oil would be needed in the attack on America. It is quite possible that the Japs have enough oil to last for several years—and they now have control of the Dutch East Indies oil fields.

In the manufacture of steel an important item is steel scrap. Japan has been depending on America for the bulk of its steel scrap ever since its steel mills were built, and in recent years we have sold them enough steel scrap to keep them going for the next ten years.

Copper is a necessary item in the production of munitions. During the last few years before we put an embargo on copper, Japan bought enough American copper.

per to last them for several years, at least

Aluminum and magnesium are necessary to modern warfare. Japan can produce all of these materials needed without buying from outside sources. America's greatest source for tin—Singapore-is now in Japanese hands. Manganese and chrome can be drawn in plentis upplies from the Philippines. All of the rubber-producing territory of the far Eas is now dominated by the Japanese.

Now that we are in possession of the facts, we know that we can no longer depend, wishfully, upon winning this was by waiting until Japan has run out of materials. The only way we can win it is by producing fighting equipment in greater quantities and producing it faster than it can be produced by Japan. America is blessed with huge natural deposits of iron and copper, and if the war isn't dragged out too long we can get along with such supplies of other strategic materials as we have and can get. We can't lose a minute; we have already lost to much time in getting started.

But over in Illinois the enginemen and trainmen on a railroad are still on strike for higher wages. In Cleveland a board panel set up to arbitrate a wage dispute between the machinists' union and the management of a brass and copper company has announced that it could not come to an agreement. In Massachusetts the workers in a tool plant threatned to strike unless more money were forthcoming. Another firm in Cleveland is faced with a strike unless a Labor Board panel can settle a dispute over increased wages

America is battling for its very life-of this moment we are being beaten because we can't get planes and ships and gun to the front fast enough—and there are still men in this country who will stop work on these badly-needed materiels while they palayer for wage increases

Actually, any man who stops production on munitions or war supplies in this crisis for personal gain is as much of a saboteur as though he had sold out to the enemy. He should be dealt with at the same basis.



AMERICAN CHAIN & CABLE COMPANY, Inc.

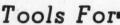
BRIDGEPORT . CONNECTICUT

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### National Defense

#### DeVilbiss Painting Machine for M54 4-Lb. Incendiary Bombs

The DeVilbiss Co., Toledo, Ohio, announces the development of a two and three-station machine for painting the exterior and interior surfaces of the component parts of the M54 4-lb. incendiary bomb. The body of this bomb consists of two parts—a cylindrical tube which contains the charge, and a tall, hexagonal tail assembly which contains the detonating mechanism. After these metal parts are made, but before they are sent to an ordnance plant for loading and assembly, both their interior and exterior surfaces must be painted. charge container is coated on the inside with acid resisting black and on the outside with zinc chromate primer. In mechanism casing is coated inside a out with the primer only.

The machine consists of a fully auto matic spray station for exterior painting signed for one or two semi-automatic spray station for interior painting, and a chain-onedge spindle-type conveyor.

After the cases have been placed a the workholders of the machine, the move into the first spray station when as they are rotated, their exterior as faces are automatically painted. The without stopping, the cases pass over a section of the conveyor which is suffciently long to provide a five minute drying period.

Fully dry for handling, the bomb body components reach the unloading station

where they are re moved from the workholders, two at a time, and placed on the stands in the semiautomatic spray stations. Then moving extension guns automaticaly coat their in teriors.

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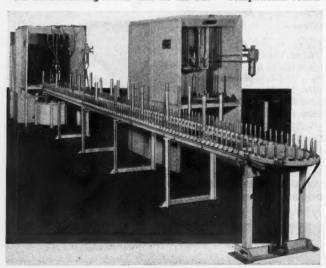
Federa

Designo

portable

A production rate of 2,000 pieces per hour is said to be maintained when the machine has a conveyor length of 25 feet





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md is provided with two semi-cutomatic spray stations for interior painting. A production capacity of 1,000 units per bour, it is claimed, can be obtained by the elimination of one semi-automatic pray station and by a suitable reduction in the speed and length of the conveyor. A production rate of 600 pieces per hour is said to be obtained by a still inther reduction in the conveyor's speed and length.

#### Federal Model K P-96 Portable Thickness Gage

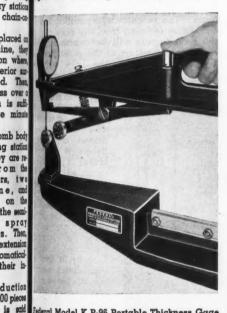
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Designated as the Model K P-96, a partable thickness gage specially designed for checking the wall thickness of



isteral Model K P-96 Portable Thickness Gage for checking wall thickness of 500-lb. demolition bombs

500-lb. demolition bombs has been placed on the market by the Federal hoducts Corp., Providence, R. I. The gage is graduated to 0.001 inch, with indicator dial reading from 0 to 100, and has a range of 1 inch. The depth of



You can save time, increase tool life and improve tooled surface finishes by preparing your soluble coolants and cutting compounds with a "LIGHTNIN" Mixer.

Whether you "make-up" for individual machines or have a central circulating or cooling system, a "LIGHTNIN" of the proper size and capacity is available to solve this problem for you. "LIGHTNIN" MIXERS CAN BE READILY CLAMPED ONTO ANY TANK OR VESSEL. They have been successfully used in large plants for mixing cutting oils for over twenty years!

Write for a catalog of "LIGHTNIN"
Mixers. State the size of tank or
tanks you use and the current
available. Complete details will
gladly be furnished.

MIXING EQUIPMENT CO., INC.

rintained machine

conveyor

25 feet

Paleting

M54 4Lb Bombs

ril, 1942

throat is 33.3 inches.

The gage is designed with a roller bearing lower anvil and roller bearing pressure unit on upper arm to facilitate handling. The upper roller unit has sufficient tension to hold the lower roller anvil firmly in contact with the inside surface of the bomb being checked.

The indicator contact point is made of tungsten carbide and is raised by pressing plunger in front of foremost hand grip. An interchangeable steel slide along the lower section guides the shell up to the locating stop.

The Federal Model K P-96 Portable Thickness Gage can be made in various sizes to suit requirements.

#### Progressive Ultra-Speed Welding Unit

With this Ultra-Speed Welding Unit, built by the Progressive Welder Company, 3023 E. Outer Drive, Detroit, Mai 3,600 welds an hour are made as non production. The job is to spot weld wheel housing to a rear quarter pa of an automobile body.

The complete operation, including time for loading and unloading the ture, bringing the points down age the work, and completing the weld cycle at a rate of two welds at a requires only 40 seconds.

#### Steele Rifle Barrel Recentering Machine

A machine designed to recenter turning) both ends of rifle barrels at the drilling and rough reaming of the bore has been announced by the W. Steele Co., 98-100 Beacon St., Worcest Mass. The recentering operation is performed by locating from the bore so that the new centers will be concentric with bore regardless of the eccentricity

the bore with the outside diameter of the barrel.

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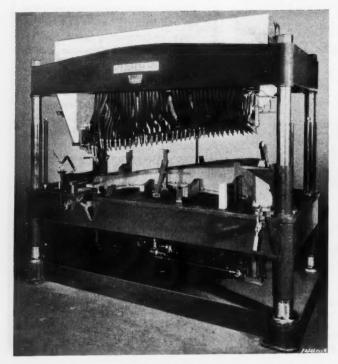
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The machin consists essential of two crutomati electric mot driven drilling heads with hor zontal spindle mounted at oppo site ends of a la narrow bed, the heads being moun ed with the spin dles in exact alig ment in doveto machined ways Directly in front each head, mount ed in the same ways, is a three jaw air chuck to holding the bar rels during the recentering operation

On the front of the machine, a pain



Progressive Ultre Speed Welding Unit

218

SIMMONS/
6" Bar Horizontal
Boring and Facing Machine

Delivery Next Month!

This new Simmons 6" Bar Horizontal Cylinder Boring and Facing Machine is the ideal machine for current War Production requirements. The bed is of massive construction and heavily ribbed to insure maintained alignment. Available with or without center section of bed.

Equipped with Simmons Micro-Feed Unit, an infinitely variable transmission, this boring machine offers both fine and coarse feeds ranging from .004" to 1.000" per revolution of spindle. The main drive to the boring bar is obtained through a six-speed gear box, motor-driven. Gears are of high-carbon steel and mounted on spline shafts with anti-friction bearings running in oil. Power Rapid Traverse to bar in both directions. Write TODAY for Descriptive Bulletin.

SPECIFICATIONS

Diemeter, Bering Bar 6" Capacity of facing heads 9" to 38½"

Travel of bar in one setting 60" Widened portion of bed 51½" x 68". 18" High



SIMMONS MACHINE TOOL CORP.

NEW YORK CITY OFFICE: 149 BROADWAY

SIMMONS

LATHES . TURRET LATHES . MILLERS . BORING MACHINES



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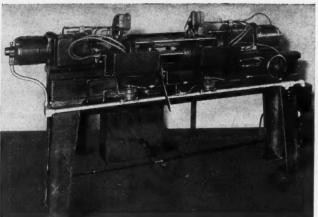
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MODERN MACHINE SHOP

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of barrel loading arms are pivotally mounted on a square shaft. In the arm

ends, in alignment with and opposed to

each other, are two air driven plungers,

the ends of which are tapered and of a

size to accurately fit the barrel bore.

Closer to the operator on the front of the

Steele Rifle Barni Recentering Machin

machine are to adjustable Y supports for supporting the barrel while they are being picked up by the plungers in bends of the losting arms.

Barrels are an charged afterness tering by opening the air chuck me permitting them is roll out on a drawing rack on the back of the machine.

The Steele Rifle Barrel Recentering Machine is available in capacities for recentering barrels of 0.3-inch bore and lengths ranging from 16 to 26 inches 0.3-inch bore and lengths ranging from 24 to 36 inches, and 0.5-inch bore at lengths ranging from 36 to 46 inches.

### "Accurate Engraving With Unskilled Operators" Engrave Iron, Soft Steel, Copper, Brass Aluminum, Plastics on the Auto-Engrave



Letters are engraved from master type (block and script letters) immished with machine. Also designs, emblems, signatures, etc. can easily be traced from original drawings. Engraves on flat and round surfaces. Vise capacity—4½"x15". Set-up quickly changed. After 30 minutes practice a novice can engrave perfectly.

AUTO-ENGRAVER COMPAN

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BUSINES

# It's a Fact



Made by Abrasive Products, Inc., South Braintree, Mass.

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MODERN MACHINE SHOP

221



SUTTON Feeders with long-life spring tension and Sutton diamond-serrated Collets with their surer grip under less tension make screw machines live longer and cut down spoilage from slipping. Ask for Sutton Catalog with complete listings.

SUTTON TOOL COMPANY 2895 W. Grand Blvd. • Detroit, Mich. Accessories for Screw Machines

### Lewis-Shepard Hydraulic-Rela Shell Truck

The Lewis-Shepard Sales Corporate 245 Walnut Street, Watertown, Ma offers a Hydraulic-Release Shell Indeveloped for the safe, quick and a handling of large shells in manipulants.

This particular truck was origin



Lewis-Shepard Hydraulic-Release Shell In

designed to handle shells 72 inches length with a diameter of 16 inches weighing 2800 lbs.

The truck is so designed that the laptivots around a point near its center gravity. This keeps the load in balants that one man can easily raise lower it. It is equipped with a gail action hydraulic release check which ther cushions the movement of the later that easy rolling, rubber tired when on roller bearings and ball bearings are dealth that easy rolling, rubber tired when on roller bearings and ball bearings are dealth that the cushions the movement of the later than the late

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**NEW CATALOG** 

just off the press — the most

comprehensive mounted wheel

catalog ever published. Shows the complete line of Chicago

Mounted Wheels with detailed

instructions for their use.

Send for copy today.

### CHICAGO



Round and round they go—millions of them—doing every conceivable kind of grinding and polishing job in machine, pattern and die shops, tool rooms, defense plants, foundries, etc.

Designed for rapid, smoother work wherever high-speed, portable grinders are used—these superior wheels of V/T Super Bond give 150% to 300% longer service, according to actual tests.

Chicago Mounted Wheels come in a wide variety of shapes, grains, grades and sizes.

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If you've never used Chicago Mounted Wheels, you might like to try a working sample. Write us the style grinder you use and size wheel desired. You'll be amazed at its performance, staming and the way it holds its shape.

### CHICAGO WHEEL & MFG. CO.

Quality Grinders and Wheels for 40 Years
1101 W. MONROE ST., DEPT. MM, CHICAGO, ILL.
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April, 1942

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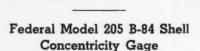
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ulic-Rela

rtown, Me Shell In sick and a in muni Federal Model 205 B-84 Shell Concentricity Gage

To transport the shell, the carrigge of the truck is first lowered to a horizontal position by the operator. When ready to unload the truck the single operator again can easily raise the carriage and shell to the vertical position.

This Lewis-Shepard Shell Truck can be made to handle other cylindrical products.



Designated as the Model 205 B-84, a shell concentricity gage for use in in-specting tracer or fuse holes, rotating band, bourrelet, and ogive diameters has been brought out by the Federal Products Corp., Providence, R. I.



gage is built for use with 75 mm. W moixed on semi-armor piercing shot. Other in and glass semi-armor piercing shot. Other in are also available.

In use, a shell or projectile is locale in a V-block on the body diameter, will which other diameters must be on centric. The points at which the pojectile contacts the V-block are fax with tungsten carbide to prevent wear Shells and projectiles up to approximately 14 lb., which is the weight of

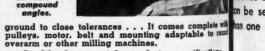
**ELIMINATES MANY COSTLY SET-UPS** AND HAND OPERATIONS

A slotting head that can be used on milling machines provides double duty facilities at a minimum of cost. It requires but little time to change from one head to the other... The SLOTMASTER can be used as a vertical slotter and shaper, operating over a milling machine as shown. The stroke is adjustable from 0 to 4"—speed range 50 to 250 strokes per minute. Tool holder of the clapper-box type can be turned in any position. All of the working parts are of tool steel, heat treated and



on a round overarm machine.

Cutting keyways on



Send for 4-page catalog and give specifications of millers to be equipped.

EXPERIMENTAL TOOL & DIE COMPANY 12603 GREINER

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the protect Engine Fuel Injector Cylcare fact der So accurate that a piston Vent wea m be fit within .00005 inch."

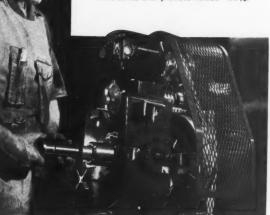


Aperfectly straight round hole to mirror finish."

### Sheffield Corporation Master Gagemakers

—uses the Sunnen MA Precision Hone to remove .015" from the carburized surface of a .372" diameter hole 3½" long in a Gaging Spindle. Machine is also used on cylindrical rings.

Time saved over previous method—50 %.



Solve your problems of accurately finishing internal cylindrical surfaces with the SUNNEN Precision HONING MACHINE

Manufacturers handling important war orders report similar acases. Using the Sunnen Precision Honing Machine to accuactly grind and finish internal cylindrical surfaces from .185" 2,2400", manufacturers can release heavy internal grinders of the work. Accuracy is guaranteed to within .0001", and as often been held to within .000025" in production work. Skilled or experienced operators are not required. Any melligent workman can produce precision workmanship with a few hours' practice.

Soves set-up time—the Sunnen Precision Honing Machine on be set up and work located ready for honing in less on one minute.

### Write for FREE Bulletin

This new bulletin will give you complete information—or if you prefer, a Sales Engineer will be glad to call with his demonstrator and show you what this machine can do for you on your job.



SUPPEN

WINEN PRODUCTS CO. 7933 Manchester Ave., St. Louis, Mo. Canadian Factory: Chatham, Ontario

to round

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#### WOODY SPENCER SAYS:

"The Right Pitch at the Right Time Fanned the 3 Heaviest Sluggers in the American League."

For two straight innings—before he retired in favor of Warneke-Carl Hub bell, opening the All Star Game in 1934— delivered a series of pitches from which none of the American League's best batters

— Babe Ruth, Lou
Gehrig and Heine
Manush—could make a safe hit. An outstanding example of pitching skill, and another instance of the right play at the right

Your right play is to check into your tapping operations. Get the greatest possible number of tapped holes per tap used. Taps are at a premium — and we will gladly assist manufacturers to speed up their tapping wherever possible. Write us today . . . you will be under no obligation. The Wood & Spencer Co., 1920 E. 61st St., Cleveland, Ohio. 1920 E. 61st St., Cleveland, Ohio.

"The Right Tap at the Right Time"



mm. shells, can be rotated many with comparative ease.

Each indicator of the gage is equip with a pantograph spring unit w protects the indicator from abuse and the same time contributes to the a racy and furnishes an adjustment contact with the shell. Each panton unit is equipped with an adju guard which prevents damage to pantograph point if the gage is care ly loaded.

This particular gage is also equippe with a sliding indicator and panto unit which contacts the fuse hole tracer cavity and checks its concentr with the outside diameter. A stop provided to locate the contact point the desired position in the fuse hole

### Federal Model 236 B-95 Shall Diameter Gage

A shell diameter for inspecting me ing band, bourrelet, ogive, and so diameters is now being marketed by Federal Products Corp., Providence, 1 Built for 75 mm.-M72 semi-armor p ing shot, the gage, which is designed as the Model 236 B-95, is designed check four diameters independently each other. The gage can also be by so that more or fewer diameters can checked, if desired.

Each indicator and its opposite a which contacts the shell, is a separ and integral unit mounted on springs which permit the indicator adjust itself independently of any d indicator on the gage. Indicators do a contact the shell directly but throu the use of pantograph spring u which protect the indicators and ma adjustments easy. Each pantograph unit is equipped with an adjustment guard which prevents damage to its pantograph point if the gage is and lessly loaded.

In use, a shell or projectile is located in the V-block of the gage. The point at which the projectile contacts the block are faced with tungsten carbide prevent wear. Shells and projectiles up to approximately 14. (the weight of mm. shells) can be rotated manual with comparative ease.

Priority on Precision SUPERIOR QUALITY MAXIMUM SERVICE LONGER LIFE

Priority on Precision—yes in every operation that is our watchword. We can't be too careful and we must maintain uniform standards. We must win.

FALCON TOOL CO.

DETROIT, MICHIGAN

WIRE FOR DETAILS AND DELIVERY DATA— WE'LL GIVE YOU QUICK ACTION!

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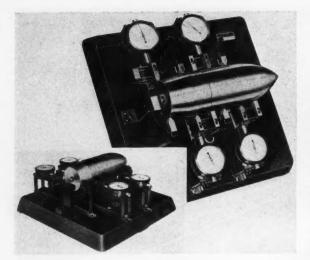
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MODERN MACHINE SHOP

227



Federal Model 236 B-8 a Diameter Gage

The Federal Model 236 B-95 Shell Diameter Gage is fast and entirely mechanical, hence requires no outside electrical or air connections, and can be readily placed anywhere at the inspector's convenience.

Houghton Hydraulically-Operated
Rifling Machine and "Cut-Max"
Rifling Oil

Designed to speed up machine gun barrel rifling production, a hydraulically-operated rifling machine has been brought out by E. F. Houghton & Co., Third, American and Somerset Sts., Philadelphia, Pa. Since the machine is designed to operate at usually high speeds we small orifices for all fine a cutting oil with his body but having propriets of heavier alls we essential to efficient eration at top speeds

As a result, E. F. Hou ton & Co. developed rifling oil of unual light body which is to meet all requireze of the hydraulically on atted rifling machine we operating at higher speeds. The oil, which known as "Cut-Max" Rifling Oil, but higher than the speeds of the speeds.

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known as "Cut-Max" Rifling Oil, is freely through the small orifices, a chead of the hook cutter, throughout entire length of the barrel. According the manufacturer, the oil has continue to perform with complete satisfaction der the most arduous conditions.

# Less Autos—More War Supplies

The following facts, released by War Production Board, show what a be accomplished by passenger axis bile rationing.

For every 24 autos we are NOT

# → GRIND-ALL ←

FOR ALL WET GRINDING OPERATIONS

A CONCENTRATE — Immediately Miscible with your present Grinding Fluid.

Used One Quart to 30 Gallons.

GIVES THAT FINISH YOU HAVE LONG DESIRED. Economical to use. SAVES TIME IN ELIMINATING SUCH FREQUENT SHUT-DOWNS FOR WHEEL DRESSINGS.

Order thru your Industrial or Mill Supply Jobber. If he does not stock or will not get Grind-All for you, send your order to our nearest plant.

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April, IA April, 19

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# PRECISION Scraped SURFACE PLATES

from the giant size (6 x 14 ft.) to the small fellows, 10 x 15 in.

From the center to the very edge, every inch of the surface exemplifies precision—in every size of surface plate—from the 10 x 15 in. size to the gigantic size of 6 x 14 ft.

Designed for accurate and dependable inspections. These plates show no distortion, and resist deflection under reasonable load.

Distinctive form of ribbing supported by specially constructed standard, equipped with unique vibration-proof adjusters, assure you of surface plates that maintain a constant level.



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MODERN MACHINE SHOP

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ing this year we have saved steel and rubber for a single 27-ton medium tank.

For each automobile we are NOT making this year we have saved enough tin to coat 1,000 cans in which to put food for our soldiers and sailors.

For every 700 automobiles we are NOT making this year we have saved enough aluminum—used in pistons and miscellaneous parts — to make one fighter plane.

For each automobile we are NOT making this year we have saved enough nickel to make 100 pounds of nickel steel for armor plate, projectiles, and

armor-piercing bullets.

For each automobile we are NOT making this year we have saved enough zinc and copper to make brass for 2,400 brass cartridge cases for the .30 calibre ammunition used in our machine guns and our Garand semi-automatic rifles and our Springfields.

For every automobile that isn't made this year we will have saved great quantities of steel and nickel and mi ber and chrome and zinc and copp and tin and aluminum and other ma rials-saved them to make the wear we must have before we can have victory.

Aero Tool Aircraft Tools. Aero Tool Aircraft Tools. A 28-pa catalog on aircraft tools has been pa pared by the Aero Tool Co., 221 Olive, Burbank, Cal. The catalog in trates and describes Aero Tool Stands Straight Rivet Sets, Offset Rivet & Microglass Polish Flat Sets, & blasted Flat Sets, Mushroom F Sets, Swivel Flush Sets, Squeezer & Custom Made Squeezer Yokes, Buch Bars, Precision Plomb Bobs, Dir Dimple Punches, Dies and Dimple Sets. One Shot Dimpling To Gooseneck Dimpling and Rivets 8 Micrometer Stop Countersinks, Counte sink Cutters, Back Countersinks a Spotfacers, Hollow Mills, Drill Bushin Indicators, Semi-Precision Drill Bui ings, Threaded Drill Adaptors, Brosch Drill Adaptors, Plastic Hammers, & Bars, Erco Riveter Tools, and Speci Copy free upon request. Tools.

. . and the hide of the Java There is no substitute for Water Buffalo such as is used in Chicago Rawhide Hammers and Mallets is the toughest and the most enduring of all. These fine tools in sizes from 2 ounces to 6 pounds are not only long-lasting but are made to strike thousands of blows accurately and safely without damaging surfaces or materials from delicate wire insulation to heavy duty yet precision made crankshafts. At your dealers.

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### Colonial VAD Dual-Ram Broaching Machine

Designed to facilitate production to meet increased war needs, an improved standard line of dual-ram broaching machines, designated as the VAD, is announced by the Colonial Broach Co., 147 Jos. Campau, Detroit, Mich. The 11 sizes range from 3 tons and 36-inch stroke up to 25 tons and 66-inch stroke. The machines feature streamlined de-

sign and increased size of the watables and rams. Peak capacities an also been increased to provide am reserve power when operating at mal rated capacities. The dual-machines are said to be especially able where extremely high producties required, since they are designed a that one operator can feed and rema a part from one ram while the other on its downstroke.

Column widths of the improved dustram machines have been increased, the

permitting increased as width with subsequed better support for who creased bars. The bareased ram width an enables the width of the work platen to be bareased.

A completely new of inder design of seames steel tubing and welds construction for less proof operation is enbodied in the machine Another feature is the vertical mounting of the main drive motor within the machine, reducing the amount of flow space required for installation.

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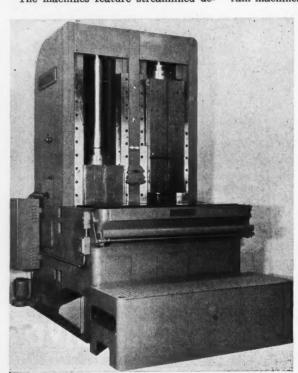
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The construction of the receding table means has been improved and simplified, allowing for the installation of chip wipers to protest the bearing surfaces of the moving platen. Ame



Colonial VAD-48 Dual-8m Broaching Machine

MODERN MACHINE SHOP

April, 190 April, 19

sign of the table provides a finished aschined pad on the front for mounting utiliary units, such as cams, and so a for automatically operating clamps, ests, and support jacks on fixtures. By pecial order, the machine can also be maged for clamping workpieces in stillow in a fixture by utilizing the ydraulic system of the machine. A stented cam lock and narrow center dide for the receding table mechanism re also incorporated in the machines.

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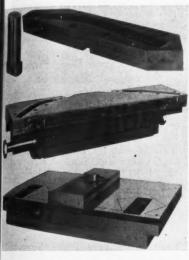
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(lop) Cam and cam follower for patented cam let receding table. (Center) Cam lock cross side and cylinder assembly. (Bottom) View of platen and cam follower assembly showing large bearing surface, narrow center guide and cam follower.

Longer travel of the receding table has been provided in the larger machines of the improved standard line. A wider range of applications with increased safety to the operator is said to be obtained, especially with broaches having deep or irregular contours. Both dual safety control and emergency knee har (for quick stops) are supplied on all machines. Operation of the rams is continuous with one ram traveling down while the other is returning to starting position.

The automatic force feed lubrication system for the bearing surfaces of the receding table as well as the ram bearing surfaces has also been improved. A sight gage for the lubrication system is mounted on the face of the column

# **START NOW!**

### **Increase Production**

End Worker Fatigue By Making Your Drilling Job Easier.



# Use the DRILLMASTER RADIAL DRILL

This floor type, heavy duty, precision-made, well balanced Radial is economical in initial cost and operating cost. It offers many features that merit your careful consideration. Drills to the center of a 36" circle... No. 2 Morse taper... Heavy duty ½ h.p. ball bearing motor... Full floating, ball bearing spindle assures free and sensitive operation at all speeds.

Send TODAY for detailed bulletin.

Wm. C. Johnson & Sons Machinery Company

St. Louis

Missouri

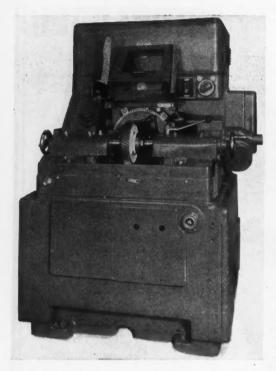


Fig. 1—Fellows No. 12 Geor Finishing Machine

with the inherent advantage of welded construction. For greater ease in installation, all machines are equipped with crane hooks at both top and bottom.

### Fellows Gear Finishing Machines

The Fellows Gear Shape Co., 78 River St., Springled Vt., has placed on the mark two gear finishing machine designated as the Nos. 12 and 24. The No. 12 machine, show in Fig. 1, is of extremely conpact and rigid design and arranged with complete electrical control. The machine is operated through push buttom the control the rotation of the tool in both directions, as well as the reciprocation of the tool.

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The tool is advanced into the workly a feed cam, and the standard cam is a arranged that the tool makes two complete cycles and then stops automatically. The stroke length of the reciprocating tool slide is controlled through dogs and micro-switches, and safely switches are included to stop the machine automatically in the case of failure of other units. A timing switch is provided to govern the period of

above the platens.

Chip room and coolant capacity are increased in the machines without increasing their overall height. All machines are equipped with heavy duty, large volume coolant pumps.

Welded steel construction is utilized for such parts as the column and table. The increased use of steel castings in the fabrication of the machines is said to combine the flexibility of cast design

# ACROMARK means "ACCURATE MARKING"

and the ACROMARKER is only one of the FAST but simple machines our engineers build for marking.

Our NATIONAL DEFENSE production of marking and numbering machines, tools and dies was over 90% last month.

Send us your marking problem—Priority deliveries are FAST.

WRITE FOR CATALOG No. 52.

### THE ACROMARK CORPORATION

9 MORRELL ST., ELIZABETH, N. J.



Specify Duckeye Lubrico....
the high lead bearing for exacting service

• Buckeye's "Lubrico" are exceptional quality high lead bearings. They combine reduced co-efficient of friction, excellent conformity to the shaft to overcome slight misalignments—and qualities of self-lubrication in event of lack or failure of regular lubricant supply—yet cost but little more than bearings of standard analysis.

Because of their physical characteristics "Lubrico" bearings are ideally suited for use in airplane services, in pumps, as seal rings, and in other cases where freedom from shaft scoring and long service are desired.

The outstanding performance of

these bearings results from Buckeye's skilful, experienced and painstaking manufacture. Through the use of virgin metals only, impurities in Lubrico bearings are held to negligible limits, and the complete laboratory and metallurgical control maintained over charging ratios, melting and pouring temperatures, and all other manufacturing processes assures the production of an exceedingly high quality of product-free from porosity-each piece of which month after month measures up fully to Buckeye's exacting specifications. No order is too big or too small for Buckeye.

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BRONZE SLEEVE BEARINGS · STANDARD SIZES OR TO CUSTOMERS' BLUEPRINT
IN ANY RECOGNIZED BEARING METAL ANALYSIS

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\$135.00 and up

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dwell at the ends of the stroke where reversal of direction of the finishing tool takes place.

The No. 24 gear finishing machine dif-

inches maximum pitch diamete, inches face width, 6 diametral pin No. 24 machine, 24 inches maxim pitch diameter, 5 inches face width diametral pitch.

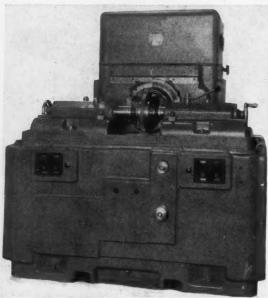


Fig. 2-Fellows No. 24 Gear Finishing Machine

fers slightly in design, as shown in Fig. 2, but is provided with similar electrical control apparatus and is push-button operated. On both of the machines, the work is supported on live centers held in adjustable head and tailstocks. The table carrying the head and tailstocks is adjustably mounted on the base so that taper in gears can be corrected. Capacities are: No. 12 machine, 12

#### Reid Smallpeice Multi Tool Production Lath

Illustrated herewith the Reid Smallpeice Man Tool Production Lath which has been brought a by the Reid Brothers on Inc., Beverly, Mass. In machine is designed for a regular turning, boring he ing, and profiling open tions and can be easily adapted to the requirement of special jobs.

The bed is extremed rigid with long bearing at faces which provide any support to the various at tachments used with lathe. The inclined reasons took, tailstock, rear aboverarms, and steady rest all of which are interchangeable. The saddle in the top of the saddle in a T-slot in which consider and of the rather thanks.

ments are bolted.

A wide range of feeds is obtainable by means of pick-off gears. A special feed worm and worm wheel can be applied to vary the complete range.

The Reid Smallpeice Multi-Tool Pro-

The Reid Smallpeice Multi-1701 reduction Lathe is fitted with a word driven headstock, the spindle being mounted in taper roller bearings. Pulmore clutch is provided for starting

### BANDSAW GUIDES REDUCE BREAKAGE

The bugaboo of bandsaw users is considerably reduced with ball bearing guides. Gain greater efficiency at lower cost with less hazard. For machines with blades  $\frac{1}{8}$  to  $1\frac{1}{2}$ " wide.

Shipped on approval-Write for details.

PADDOCK TOOL CO.

1418 WALNUT ST. KANSAS CITY, MO.



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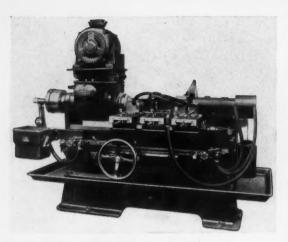
### A VARD SNAP GAGE

We have just introduced a new precision checking tool in the VARD Roll Thread Snap Gage. This VARD gage offers definite improvements over existing gages. It not only checks the pitch and depth of the thread to be inspected but also checks the lead. Furthermore the new VARD snap gage will check threads right up flush against a working shoulder.

This is a beautifully made production inspection tool with Go and No Go thread rolls. Its rolls are ground from special tool steels and are fitted with eccentric pins to compensate for wear. The gage fits the hand and is easy to use.

VARD Roll Thread Snap Gages are made in a full range of sizes in tolerances from 0 to several thousandths. They can be sold to holders of high preference ratings.

VARD ING. PASADENA, CALIFORNIA



Reid Smallpeice Multi-Tool Production Lathe

and stopping the spindle. When arranged for independent motor drive, the motor is mounted on the headstock, driving the pulley by means of V-belts. The lathe can be supplied with low, medium, or high speed headstock, ac-

cording to the worm not each head having a nuber of ranges governed the motor pulley size. In different speeds in each range are obtained by pict off gears. The

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The machine is supplie equipped with an air-operated tailstock which is fit ted with revolving spinds mounted on anti-friction bearings. A lever-operate and wheel-operated tallstock can also be obtained.

The screw-operated for cross slide is adjusted has means of a graduated has wheel. A stop is provide for accurate setting of depth of cut. The machinis also available with leve-operated front cross slide profiling front cross slide and narrow screw-operate

swiveling front cross slide.

1804 Madison Ave.

The rear cross slide of the latter provided with a dovetail to which to blocks are fastened. The slide is ope ated by a pair of diagonal racks white engage directly with one another. On



240

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### Safeguard your production from the scrap pile

Quick production is not your only problem. Machine tools may be speeded up, hours saved by better set-ups, over-time and extra shifts may be installed. Yet this will be of no avail or benefit if the accuracy of your product is lost with your material ending on the scrap heap. The best investment for any shop is in inspection tools to detect and eliminate the errors at the source before they can affect production.

Give your men the right tools to measure with. Remember that whether you manufac-ture to close tolerances of "tenths" or to ture to close tolerances of "tenths" or to wide tolerances of plus or minus .002", you must still start with the basic accuracy in tenths of thousandths or else your work will not interchange with that produced in other shore. other shops.

Invest in the Scherr Limited Budget Inspection Laboratory to guard against future rejections, disputes and loss of time, labor

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Acquired to inspect the surface of gage blocks, for Swill be proposed surfaces of all kinds and parallelism of micrometer anvils. Single parallels. \$10.00.

Parallels, Vi turn of micrometer screw....\$25.00 set of 4 one-half inch thick....\$85.00 set of 4 one-half inch thick....\$85.00 set of 4 one-half inch thick....\$90.00 set of 4 one-half inch thick....\$90.00 set of 4 one-half inch thick....\$90.00 set of 4 about one inch thick.....\$90.00 set of 4 about one inch thick....\$90.00 set of 4 about one inch thick.....\$90.00 set of 4 about one inch thick......\$90.00 set of 4 about one inch thick.......\$90.00 set of 4 about one inch thick........\$90.00 set of 4 about one inch thick........\$90.00 set of 4 about one inch thick.........\$90.00 set of 4 about one inch thick.........\$90.00 set of 4 about one inch thick..........\$90.00 set of 4 about one inch thick............\$90.00 set of 4 about one inch thick............\$90.00 set of 4 about one inch thick...........\$90.00 set of 4 about one inch thick..............\$90.00 set of 4 about one inch thick...........\$90.00 set o tion Laboratory to guard against nuture formation and material.

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water standard of medsurements, from which all production starts and all medsuring tools and gages, used broughout the shop are checked and set. There are impead small sets of our Ultra-Chex lines to suit all multements. 34-block set, \$125.00 F.O.S. New York lots also Adjustable Snap Gages.

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Gives accurate dependable readings in 1/1000".
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rack is attached to the slide and other to a threaded rod running at the back of the bed. This rod is on ated by a cam and lever feed meanism. A hand-operated rear cross at can also be supplied for forming or off operations.

#### Yale "Timber-Lock" Skid Platfo

Designed to conserve steel for designed skid ple form made of specially selected but oak wood and said to be so construit as to practically defy breakage is nounced by The Yale & Towns in Co., Philadelphia Division, Philadelphia Division, Philadelphia Division, Philadelphia Pa. According to the manufacture large part of the strength of the ple form, which is known as the "Imbe Lock," is traceable to an interlocin "wood - weld" process by mean which supporting leg runers and to



Yale "Timber-Lock" Skid Platform

boards are tied into one virtually is separable unit.

In constructing the platform, to deep grooves are cut along the emit length of the platform deck boards, interaction of which a hard oak beam it tightly fitted, thus interlocking platform and beams in a vise-like grip to its said to completely eliminate rocking shaking, and other forms of instability. To further ensure this one-piece rightity, beams and deck are bound together with specially cement coated spirals Helical nails, binding platform all beams at double-rowed 1-inch alternation therefore the spirals along the entire platform length.

Legs are of high grade formed see bars, joined to leg beams by hear forged steel bolts. Washers on the and bottom of the bolts assure reclamping. In addition, the large discreter steel washer under leg bolt hear provides wide bearing point and ensure leg stability.

leg stability.

The Yale Timber-Lock Skid Platon is available in all standard widths all lengths, plain or armored end, also retical or standard leg design; four or illeg construction.

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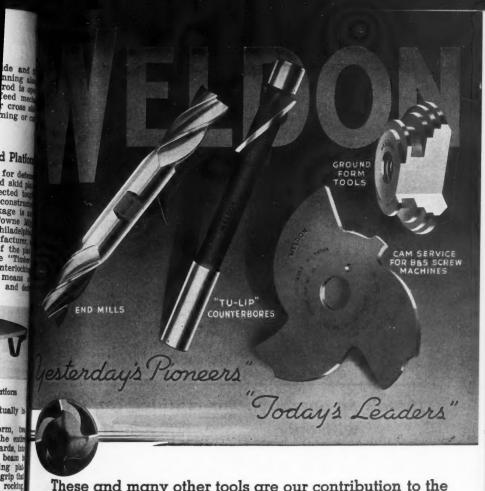
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These and many other tools are our contribution to the vital defense program now under way.

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We are doing our utmost to produce tools in quantities ample to serve your production schedules—but never will Weldon quality be sacrificed despite the tremendous demand for quantity.

Weldon tools will not "let you down" in your efforts to do a share in our country's defense.

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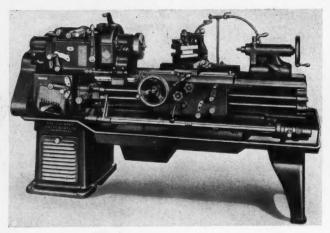


Fig. 1 — Cincland "Maxi-Production" Geared Head Late

# Cincinnati "Maxi-Production" Geared Head Lathe

Supplied to meet specific requirements, the Cincinnati "Maxi-Production" Geared Head Lathe shown in the illustration Fig. 1 has been introduced by The Cincinnati Lathe & Tool Co.,

Marburg Ave., Oakley, Cincinnation Ohio. The lathe havailable in 14, 18, 20, 22, 24, 7, and 30-inch size, and in 2-foot lengths of befrom 6 foot and h

With the lath 32 changes of thread and feed can be obtained in addition to point a spindle speed which are said in cover every protical machine sho

requirement by simply shifting a leve. The lathe, however, is so arranged the 64 additional changes of thread and feed, as well as 12 more spindle speed can be obtained.

Construction features of the Cincinati Maxi-Production Lathe include a multiple length automatic feed stop.

### There's no operation this machine can't handle

ONE WORK SET-UP

You can handle every milling, drilling, boring, grinding job—at any angle or compound angle—in horizontal and vertical planes—without changing the work set-up.

On a Fray "All Angle" Milling Machine you have 10 inches of cross travel above the table. The Turret Head is 111/s" in diameter, machine calibrated.

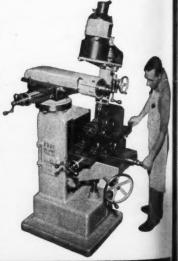
The Head can be rotated a full 360° in both planes, for any angle or compound angle. The Ram has 10" of in-and-out movement.

Specifications of the FRAY No. 7-B are identical with those of the Fray No. 7, proven by toolmakers all over the world.

# FRAY MILLING MACHINES FRAY MACHINE TOOL CO.

503 W. Windsor Road

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**SINCE 1885** 



Fig. 26

Fig. 8

High Speed Blades. Adjustable for Wear. Deliveries Good.

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multiple position carriage stop, and compound and adjustable rear rest Various styles of four-way turrets can be furnished, as well as six-way hexagon turrets.

The multiple length automatic feed

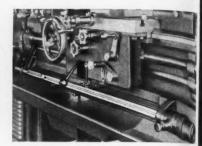


Fig. 2-Multiple Length Automatic Feed Ston

stop (Fig. 2) is fully equipped with in adjustable length stops, which are submatically indexed by a trip lever mounted in the apron. The stop may also be set to any of the six position by raising the locking pin on the repearing of the stop rod and turning the index control to the desired setting. The locking pin assures positive indexing when the trip lever is used. The adjustable stop dogs may be set within 1/2 inch of each other and are designed to stop the feed to the carriage within 0.002 inch,

The multiple (six) position carriage stop (Fig. 3), when used with a spacing rod as shown in the illustration, pro-



Fig. 3-Multiple Position Carriage Stop

vides as many settings as may be required. The length of the rod, the number of steps, and the distance between each step is determined on order. In this particular case, the rod is ground with seven stops, each I indapart. Combining this with the six position stop bolts permits 42 possible settings. Each of the six stop bolt may be adjusted over a length of I inches. The usual procedure is to power feed the carriage to within 0.010 inch of

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ril, 1942

## March, 1942

### SOFT ABRASIVE IAPPING COMPOUNDS

### CRYSTOLON LAPPING COMPOUNDS

Made expressly for use on NORTON LAPPING MACHINES

These compounds contain a carefully selected abrasive that cuts rapidly at first, then in a gradual uniform manner breaks down so that the very finest abrasive particles perform the final lapping or finishing action. The abrasive is suspended in a special grease or oil composition base that becomes an oily film under pressure of lapping, a base developed expressly for hand, plate and machine lapping. For extra lubrication this base mixes rapidly with sperm, kerosene, spindle, linseed, olive, etc. Only tests can determine oil best suited for your needs. Grade No. 3021/2 Medium Coarse

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No. 3031/2 Medium Fine

No. 304 Fine

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Lapped parts clean readily with solvent oils.

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Samples upon request.

These compounds contain Norton Company's CRYSTOLON, (TM Reg. U. S. Pat. Office), that sharp cutting abrasive for hardened metal and alloy parts aluminum.

The abrasive is suspended in a composition oil and grease base that was developed expressly for lapping; mixes readily with sperm, spindle, mineral seal, linseed, kerosene, olive oils, etc. Heavy lubricating oils not recommended.

Grade No. 1020 Coarse

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No. A)

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Lapped parts clean readily with solvent oils.

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## UNITED STATES PRODUCTS

728 FILBERT ST.

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the stop, the remaining distance being fed by hand. Duplicate parts may be finished with this unit within 0.001 inch.

or the movement of the teeth past the grinding wheel is obtained by a double pawl arrangement, which is said to

#### Howe-Lindsey Automatic Saw Sharpener

Howe & Son, Inc., Hinsdale, N. H., has brought out a high speed automatic sharpening machine for sharpening and reconditioning hack saws, band saws, circular saws, metal slitting saws, and so on. Although compactly designed, the machine, which is known as the Howe-Lindsey Automatic Saw Sharpener, has a capacity for handling any size hack or band saws, circular saws up to 20 inches in diameter, and metal slitting saws and milling cutters up to \$\mathscr{H}\_1\$ inch thick.

Once adjusted to a given saw, the machine is entirely automatic in operation and is said to require a minimum of attention. Saw tooth pitch or spacing is set by a simple adjusting screw at the end of the crankshaft, while the weight of cut or positioning of the tooth edge to the wheel edge may be varied while the machine is in operation by turning a slowly oscillating knob just to the rear of the saw clamp. Indexing



Howe-Lindsey Automatic Saw Sharpener

eliminate any stoppage due to a broken saw tooth, the broken tooth space passing under and beyond the wheel in the same manner as the perfect teeth.

The Howe-Lindsey Automatic Saw Sharpener operates at a speed of & teeth a minute. Each type of saw is



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for Grinding and Lapping Carbide Tipped Tools, Alloy and H.S.S. Tool

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### WITH A CITIES SERVICE CUTTING

An important manufacturer of electrical appliances was confronted with a cutting fluid problem on some of his automatic screw machine operations. These machines are required to do a number of operations on a variety of metals. The sequence of operations involves frequent changes of stock.

The problem was to find a cutting fluid that would be adaptable to these changes and per-form equally well with all. A Cities Service lubrication engineer solved it with one of the Chillo Oils. Results: Improved tool life — increased production—lower production costs.

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ground to its proper rake and clearage angles by an ingenious method of tra ming the wheel edge. The machine powered by means of a single phase, h.p., 110-volt motor and is equipped with a fo-inch diameter, 1/2-inch has and bevel edge.

#### Progressive Welding Gun Attachments

Designed to eliminate the balance machining of rotating parts on which accurate dynamic balance is required two welding gun attachments for bal-ancing machines have been developed by the Progressive Welder Co., 3022 E. Outer Drive, Detroit, Mich. The guns are also said to eliminate the necessity of leaving excess stock on parts for the purpose of dynamic balancing.

The gun shown in Fig. 1 is fitted with

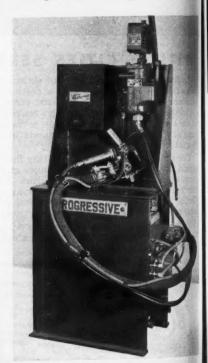


Fig. 1-Progressive Welding Gun Attachme

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Gun

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If you need a stone that will give you accuracy to the millionth of an inch—that are always uniform in cutting
qualities—that are guaranteed to be of exactly the same
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1942

a bracket which hooks over the ring gear of a hydraulic coupling. The gun is swung over and a balancing lug of the weight needed is spot welded to the housing.

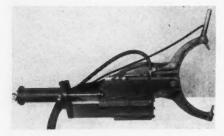


Fig. 2—Progressive Welding Gun Attachment Actuated by an Air-Cylinder. Welding is Direct, the Gun is Hydraulically Operated

The gun in Fig. 2 is semi-automatic in operation and moves into welding position by means of an air cylinder. Welding is indirect. An adjustment is provided for jaw opening. Both guns are hydraulic in operation.

### Michigan Model 1205 "Sine-Line" Lead Checking Machine

Designed to check right and left-had spiral gear leads from zero to infinity a lead checking machine, designated the Model 1205 "Sine-Line," is a nounced by the Michigan Tool Co., in E. McNichols Rd., Detroit, Mich of the adjustable sine-bar type, the machine eliminates any need for master rolls, discs, or lead screws in checking gears and can be used with a Michigan gear checking recorder if desired. Gas size capacity of the machine is 0 to 1 inches diameter, with distance betwee centers of 24 inches. Bed lengths of a and 48 inches are available on order.

The machine is of the horizontal type designed for maximum rigidity to a tain utmost accuracy. The operating mechanism, including the sine-bar, is completely enclosed and protected against dust. All adjustments are at a convenient working height, including that for the sine-bar.

The machine consists primarily of two "tables," a transverse table enclosed in the left end of the machine which arries the sine-bar, and a longitudinal table which carries the indicator. The sine-bar table is arranged to reciprocate

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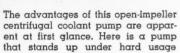
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twenty-four hours a day, seven days a week, without replacements. Model 600 is not a makeshift pump but the newest addition to a quality line-identical in general construction to the other five BRADY-PENROD models used as standard equipment by machine tool manufacturers.



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#### CONTROLLED FLOW

Pump will deliver water or light oil at the approximate rate of 60 gallons per hour with 3/8" tubing to 1,200 gallons per hour with 1" pipe.

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Any shop man can install the Model 600 easily and quickly at little cost.

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Fig. 1—Michigan Model 125 "Sine-Line" Lead Checking Machine

crosswise of the machine, while the longitudinal table moves lengthwise, paralleling the face of the gear to be checked.

The sine-bar table, when moved back and forth, rotates the spindle on which the gear is mounted for checking. When the sine-bar is set parallel to the axis of the machine, gears of infinite lead (equivalent to straight spur gears) can be checked, since longitudinal movement of the indicator table produces no movement of the transverse sine-bar table. For any angular position of the sine-bar, movement of one table produces a corresponding movement of the other and of the spindle according to a simple formula which takes into consideration characteristics and dimensions of the gear, as well as the desired

lead to be checked. Friction rolls provide two ratios of the spindle to the sine-but table. Selection of the proper set of rolls is made by moving a lever under the cover enclosing the sine-but table. The two ratios provide for all diameters and lengths of gears within the operating range of the machine.

The correct setting of the sine-bar is established elther by the use of micrometers of gage blocks placed between the end of the bar and special 1-inch diameter locating pins mounted in the transverse table. The micrometer dimension of gage block length is also readily established by simple formula. Once the

sine-bar is set in position, no resetting is necessary as long as gears of the same diameter and lead are being checked. The sine-bar is fully exposed for setting by swinging open the cover at the left end of the machine.

Complete flexibility is also provided for checking either face of each gent tooth and at any depth, whether right or left-hand spiral. The simple design and arrangement of the indicator petal enable it to be easily swung into contact, thereby saving time when checking several or all teeth of a gent. One face of a tooth may be checked with the indicator in the position shown in Fig. 2, and the other face by swinging the indicator to a position 180 degroom this position. For indexing to another tooth, the lever on the headstock



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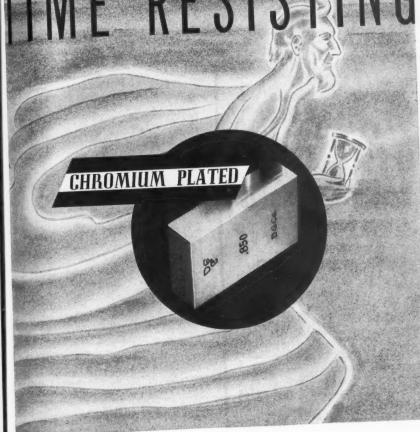
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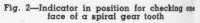
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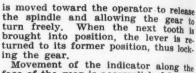
Diamond **Importers and Toolmakers** 





handwheel reciprocates either or both tables according to the desired sine-bar setting.

To assure utmost accuracy, all spindles are mounted on preloaded bearings, including the tailstock spindle. The sine-bar table also travels on ball bearings, and the yoke over the bar which transmits motion to the indicator table is similarly mounted. A special feature of the design of the sine-bar table is the use of narrow 3-point ball contact guides, combined with groved wide ways, also on ball bearings, which adjustable to eliminate movement of the sine-bar table. ways are equipped with hardened and ground inserts where contacting the ball bearings. As a result, backlash is eliminated between the said to be spindle and the mechanism connecting The indicator is it to the indicator. The indicator is graduated in ten-thousandths for casy checking.



face of the gear is accomplished by two controls on the front of the machine. The lever to the left of the handwheel determines whether the sine-bar or the indicator table is the driving member, depending upon the angle of lead. The

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March, I

# Here's why shops busy on the armament program insist on Delta Grinde

I. Special motors designed and balanced exclusively for Delta grinders.

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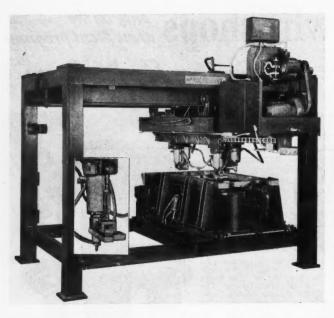
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Also send me your latest Delta catalog of industrial news teals. trial power tools.

\_\_\_\_\_

No. 1246



Progressive Knee-Action "Walking" Welding Guns

Designed to permit the performing of multiple welds in sequence in an automatic machine where it is preferable to hold the work stationary in large fixtures, a line of knee-action "walking" welding guns has been introduced by the Progressive Welder Co., 3023 E. Outer Drive, Detroit, Mich. A machine developed for welding the back panel into a refrigerator shell is shown herewith equipped with Progressive Knee-Action "Walking" Welding Guns.

The machine is designed to handle

Automatic welding machine equipp with Progressive Knee - Action Welding Gun ing for use in welding back panels into n frigerator shells

two sizes of such shells and welds one assembly while another is being loaded and unloaded. Shell and back panel are dropped over a locating fixture which incorporate an electrode. Clamping is by air pressure. (One fixture of the machine has been removed to show the clamping mechanism at the side of the first fir-Whena ture.) button is pressed

the entire operating head of the machine moves to a position above the loaded fixture. Pressure on another button starts the automatic welding oper-

ation.

four gun points descend and The make four welds, pairs of guns welding in series. At the same time, the chain shown commences to move. The motion of the chain is continuous, carrying the heads of the welding guns along. Welding time is controlled by an electronic timer. When the weld is completed is released from the gun pressure points, which swing, under spring pressure, to a new position farther along, depending upon the amount the chain

#### NO BELT SLIPS WITH VACUUM CUP C. 1. PULLEYS



258

Pat'd U. S. Canada **Great Britain** 

30 Day Free Trial Offer.

Stock most Std. Sizes to 16" Dia. Supply sizes 2" to 72" Dia.

Shut Off Expense Caused by Slippage You Save Money on Every Installation

NEW LOW PRICED PRODUCTION LINE SEE PART LIST Send for List-On the Shell

**Prices Below** Dia. Face Price Dia. Face Price 4 " x 31"— 41" x 51"— 2 " × 2\"—\$1.25 2\" × 2\"— 1.45 3 " × 3\"— 2.25 3\" × 3\"— 2.55 × 25 — 1.45 44 × 55 — 3.95 × 3½ — 2.25 5 "× 4½ — 4.25 × 3½ — 2.55 6 "× 5" — 4.75 Supply Fractional Dia. and Face Pulleys—Fit

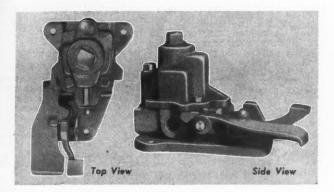
Increase Production

Large Casting Stock.

VACUUM CUP METAL PULLEY CO., in 12536 Grand River Ave., Detroit, M

March,

# welding equipped gressive situr Control!



## HANNA Foot Operated Valves

· Here is a sturdy, tight, quick-acting valve of the packless spool type. It operates with minimum movement of piston and foot pedal. Depressing treadle admits line pressure to cylinder — a latch holds it down until tripped, which causes automatic reversal. If you need the best in control valves the answer is Hanna. Write for details.

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Air and Hydraulic RIVETERS

Air and Hydraulic CYLINDERS

Air HOISTS

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has moved. Another weld is then automatically made, and the guns advance another step. The parallelogram construction at the guns permits the top of each gun to move while the electrode is

stationary.

To complete one assembly, each gun takes 19 steps and makes 20 welds, 1½ inches apart. When the shell in one fixture has been completely welded, the machine operating head moves over the second fixture, which has been loaded in the meantime, and repeats the automatic welding cycle, with the exception that the movement of the guns is now in the opposite direction, the chain reversing its travel at the end of each complete cycle of welds. Off-time between welds, which permits the guns to move on to the next location before welding current is supplied, is controlled automatically by a notched timing disc. Time for a complete welding cycle is approximately 12 seconds, during which time 80 spot welds are made.

Mead H4 Air Clamp

Mead Specialties Co., 15 S. Market St., Dept. 10A, Chicago, Ill., is now marketing the H4 air clamp shown here

for use in light milling operations. The clamp, which is designed to produce a hold-down pressure of four times the line pressure, is also said to find with

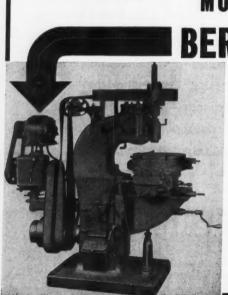


Mead H4 Air Clamp

application in assembly jigs.

An outstanding feature of the Meal H4 Air Clamp is the ease with which it can be set for various operations. By means of the unit, jigs can be reduced to the simplest forms and built-in clamps and hold-downs eliminated. In addition, due to the flexible pressure of the clamp, variations in thickness of work (a frequent source of trouble with castings) are said to cause no difficulty or delay in clamping.

MODERNIZE WITH A ERKELEY DRIVE



Today, production is all important. Every available machine tool should be utilized and those that are old need modernization—a job that can be efficiently accomplished with a Berkeley Drive.

There is no machine in your plant that we cannot efficiently motorize. We manufacture a drive suited to your requirement. V-belt — Helical Gear — Variable Speed (P.O.S.) — or Quick Change Gear Drive. Each drive is custom-built to your particular machine. This is accomplished by the Arc Welded Steel Bracket Construction.

Get greater production with a Berkeley Drive attachment. Write for details.

THE BERKELEY EQUIPMENT CO.
CORRY PENNSYLVANIA

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Procunier creased of dously in this possis 390 to 20 convention adequate No. 2 to 3. Extra veniently adjustment versing

The new exclusive tap to est more acting as a ping efficient free thread.

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PROCU 12 S. C Send n Tru Machin

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April, I

# New Tapping Unit Has Definite Advantages for You

**Produces Better Tapping at LOWER COST** 

Procunier Universal Tapping Machines give increased output, more accurate tapping and tremendously increased tap life. The features that make his possible include: 1. Four speeds, ranging from 30 to 2050 RPM. efficiently handle jobs for which conventional high speed tapping machines are inadequate. 2. One machine handles tap sizes from No. 2 to ½" through two interchangeable heads. 3. Extra long Spiral Compensating Springs conveniently located, with wide range hand screw adjustments, maintain pre-set tap feeding and reversing pressure INDEPENDENT OF OPERATOR.

#### Tap establishes its own lead!

The new Procunier Universal Tapping Machine is exclusively designed so that it actually allows the tap to establish its own lead. There is nothing more accurate than a precision ground thread tap as a guide for tapping—so maximum tapping efficiency is attained where an accurate tap is free to establish its own lead in cutting the thread.

thread.

This exclusive Procunier feature means more accurate tapping with every thread uniform, greater production with less spoiled work and less tap breakage.

SEND FOR CATALOG giving full details, description and prices on the full line of Procunier Universal Tapping Machines, hand or foot operated, the complete line of Procunier Precision Tapping Heads to meet all needs and the new Tru-Grip Tap Holder.

#### PROCUNIER

SAFETY CHUCK COMPANY 12 S. Clinton St., Chicago, III.

PROCUNIER	SAFETY	CHUCK	COMPANY
12 S. Clinton			

Send me bulletins on: High Speed Tapping Heads Tru-Grip Tap Holders Universal Tapping Machines.



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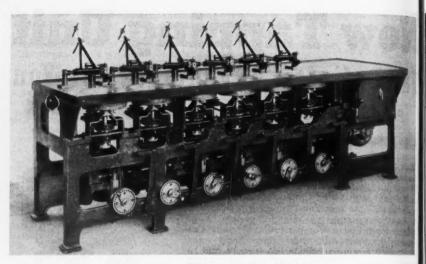
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Lehmann Optical Grinding and Polishing Machine

#### Lehmann Optical Grinding and **Polishing Machine**

To meet the demand for a machine of great rigidity in grinding and polishing optical lenses for use in various types of instruments, and so on, the George Scherr Co., Inc., 130 Lafayette St., New York, N. Y., has brought out the Lehmann Optical Grinding and Polishing Machine shown herewith, machine is a six-spindle light duty polisher with hardened steel spindles running in tapered bronze bushings, which are adjustable for wear.

The machine, including the frame and table, is of heavy construction for rigidity in operation. Adjustment of spindle and crank speeds is easily made by releasing pin stops in indexing discs

and rotating cranks after disengaging friction produced by hand levers. Adequate lubrication is provided for all bearing surfaces through a central Alemite lubrication system having easy access from the front of the machine.

#### Scherr "Little Wonder" Radius Dresser

Designed to speed up and simplify the dressing of grinding wheels for variou types of grinding work, a radius dresse to be known as the "Little Wonder" has been added to the line of machine tool accessories marketed by the George Scherr Co., Inc., 130 Lafayette St., New York, N. Y. The device is used in con-



#### FEATURES LOOK THESE AT

- No honing. Will not chatter. Chrome-like finish.
- WILL SHIP ON 30 DAYS' TRIAL
- · Perfect alignment.

4541 RAVENSWOOD AVE.

- Full bearing surface.
  Left and right spirals.
- Cannot fall in slots or oil grooves · Extension pilots for line-up work
- REAMER CORP. EVANS FLEXIBLE

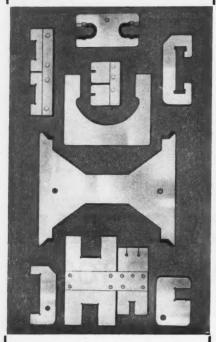
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• 50 to 80 thousandths expansion.

WRITE FOR CIRCULAR



## SNAP GAGES



Made To Your Specifications.

We also make special plug gages to your specifications.

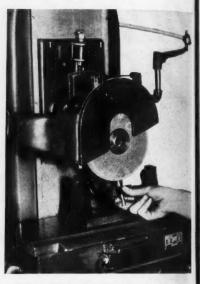
We have no catalog, nor do we carry standard sizes.

R. KRASBERG & SONS MFG. CO.

925 Wrightwood Ave. Chicago Illinois junction with a diamond tool to drea wheels preparatory to grinding forming tools, fillets, end mills, and rake angle on collapsible tap chasers. It will dress either convex or concave radii from to 1 inch and can bet set with regular 1-inch micrometer, depth micrometer, or height gage.
The base is made of cast iron, espe-

handl

A st shop



Scherr "Little Wonder" Radius Dresser

cially alloyed, rough machined, and normalized before finishing to prevent changing. changing. The swinging arm is made of cast iron and heat-treated before finishing. Centers are turned at both point and sides, hardened and lapped

#### Dillon "Hercules Jr." Tensile Strength Testing Machine

Designed primarily for the expansion testing of products or materials requiring less than 1,000 lb. to pull then apart, the Dillon "Hercules Jr." Tensile Strength Testing Machine illustrated herewith has been placed on the market by W. C. Dillon & Co., Inc., 5410 W. Harrison St., Chicago, Ill. Outstanding features of the machine are the size and weight. The unit measures 2 inches long x 8 inches high x 21/4 inches wide and weighs 25 lb., thus making "

April, 19

# STEEL BOXES

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# Immediate Shipment!

#### TAPER PANS

One-piece, all-welded construction. Hook handle at each end. Will nest perfectly when empty.

No. 101—10"x18"x6"—18 Gauge, each, \$ .75 No. 102—12"x20"x6"—16 Gauge, each, \$ .90



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#### SHOP BOXES

A straight side shop box with rigid handle and hook hole each end. Excellent for shop use where stacking feature is not required.

No. 401—10"x16"x6"—18 Gauge, each, \$ .85 No. 402—12"x18"x8"—16 Gauge, each, \$1.10



ORDER TODAY, WRITE, WIRE OR PHONE

#### STACKING BOXES

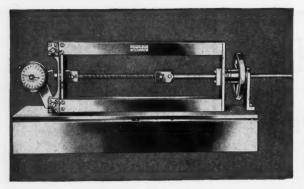
An ideal all-purpose shop box. Sturdy allwelded construction. Heavy skids act as a positive stacking lock and reinforce box at point of maximum wear.

No. 601—10"x16"x6"—18 Gauge, each, \$ .95 No. 602—12"x18"x8"—16 Gauge, each, \$1.25



#### AMERICAN METAL WORKS, INC.

1519 GERMANTOWN AVE., PHILADELPHIA, PA.



Dillon "Hercules Jr." Teni Strength Testing Machine

cial jaws can be mai to fit individual needs

A zero adjustment provided on the Hercule Jr. to compensate in temperature change. Additional features d the machine include mi ber feet to protect tale or desk top from me ring, and baked gray crackle or baked black crackle finish as desired

readily portable and also enabling it to be easily placed on a desk or table top. In addition, the machine is said to be easy to operate, no special charts or instructions being required, and is said to be so constructed that an overload will not injure it.

Gripping jaws supplied with the Hercules Jr. are of the clevice type, a kind that can be universally used for general testing. Jaws are interchangeable for various types of gripping, and have a maximum opening of 12 inches. Spe-

#### Stoffel Safety and Inspection Sea

A completely tamperproof safety and inspection seal for sabotage prevention is now being manufactured by the Stdfel Seals Co., Inc., 188 Water St., Ner York, N. Y. The seal, which also provides for secret identification marking is said to guard and fully guarante against any tampering, alteration, a substitution of parts or products.

\*BURGESS vibro-too

Puts Permanent Identification Markings On Industrial Materials, Production Parts, and Finished Goods

Plants everywhere find Vibro-Tool offers the simplest, fastest and most economical method of marking jigs and dies for identification; cutting identifying numbers on production parts; engraving names on identification disks; engraving trade-marks or other insignia on finished goods; writing names of persons or departments on tools or other equipment; cutting cloth patterns; engraving names or designs on glass; cutting rubber patterns and gaskets, etc., etc.

Tool uses vibration principle...120 vertical strokes per second...
60 cycles, operating from any 110 volt AC outlet. (Does not operate on DC.) Made of finest materials; encased in plastic case. Can be used skillfully by average workman.

on DC.) Made of finest materials; encased in plastic case. Can be used skillfully by average workman.

Hard steel is easily marked by using a Tungsten needle. Transformer available for use in connection with Vibro-Tool to etch on exceptionally hard steel through invoking the electric arc process. Transformer may be used for long periods without getting overheated. Portable; weighs only 1 lb. Price complete \$7.50, for carton containing tool and ordinary needles. Special needles, cutting points and other accessing available at reasonable extra cast.

and other accessories available at reasonable extra cost. Send for illustrated folder giving complete details, gladly sent FREE.



**Handicraft Division** 

184 N. Wabash Ave. Chicago, III.

Engraves on Steel

At this cutting from 5 the ne ting Ti 1 m made cutting

3 min. Air maxin

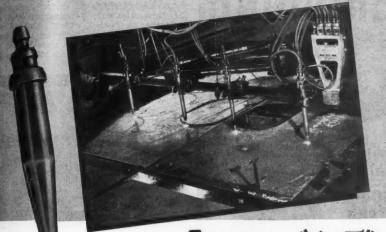


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SUPPLIES

Now 4 cuts in 2 min. 42 sec.

... INSTEAD OF 3 MIN. 45 SEC.



High Speed MACHINE CUTTING TIP \*

At this plant, an Airco Travograph is flame cutting four identical shapes, 77" in periphery, from 5/16" steel plate in 2 min. 42 sec. — with the new Airco "45" High Speed Machine Cutting Tips.

1 min. 3 sec. — this is the saving in time now made possible by the Airco "45" in this multiple cutting operation, which until recently required 3 min. 45 sec. with conventional tips.

Airco "45" was developed to bring you maximum cutting speeds — at a time when

speed became essential to the country's war efforts. It increases the speed of machine gas cutting by 20 to 30% — without sacrifice in the quality of the cut and with no increase in oxygen consumption.

If your plant is engaged in war production and utilizes Airco oxyacetylene machines for cutting steel up to 8" thick, we urge you to ask your nearest Airco office for further details or to request our 8-page bulletin on Airco "45".

Air

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withing and Everything for GAS WELDING or CUTTING and ARC WELDING

April, 1942

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MODERN MACHINE SHOP

## DUST-FREE GRINDING



The use of water on grinding wheels removes dust at its source, eliminates dust hazard to surrounding equipment, lessens tool damage, and gives finer finishes.

Grinder and coolant pump motors operate simultaneously.

Sizes 2, 3, and 5 HP for 12" to 18" wheels.

Let us show you the many advantages of grinding the "Standard" way.

Complete line of grinding equipment.

Write for new catalog 43.

The STANDARD ELECTRICAL TOOL Co.

BURNS and EIGHTH ST.

consists of two components; namely, pre-shaped metal seal-cup and individualized identification disc, which is multi-color printed.

The great advantage of multi-cole discs is that, in addition to carrying c om ple te identification information basic colors serve as instant indication of time element, process, location of priority of sealed object, and so multi-collection priority of sealed object, and so multi-collection priority of sealed object, and so multi-collection markings, such as inspector number and department number, can be incorporated in the pliers used in sealed





Stoffel Safety and Inspection Seals in Use

ing so that at the moment of closing the pliers these markings or number are indented into the identification disc

Stoffel Seals can be permanently applied with either string, thin cord, or two-ply wire, which ever is most sullable to the sealing operation with the lightweight sealing pliers. Once the two component parts are locked, the seal cannot be tampered with without immediate visual detection.

Stoffel Safety and Inspection Seals are already said to be effectively alding National Defense in keeping fire extinguishers of plants safe from interference after periodical inspection without in

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April, 19



OTHER TYPES AND SIZES.

PRODUCTION MACHINE

GREENFIELD

ALSO TOOL AND CUTTER GRINDERS— SENSITIVE DRILLS. "Lubrigard" Protected
PLAIN • PRODUCTION • UNIVERSAL TYPE
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General Engineering & Mfg. Co.

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**MULTI-PURPOSE** 

SHAPERS

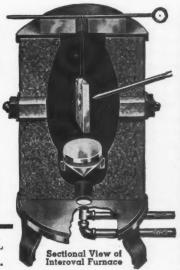
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# NOW- the heat treating FURNACE that industry's looking for, at HALF the PRICE

The INTEROVAL FURNACE is the product of almost a half century of heat treating experience, for hardening expensive tools and dies safely and accurately. No possibility of surface decarburization or distortion. Heat treats "Moly" steels without any trace of scale or soft skin.

Overall size—32" high x 20" in diameter. Heating chamber—14" high, 9" in diameter at center, 7" in diameter at top. Weight—550 lbs.

This turnace is gas-fired and can be operated at an average cost of 25c per hour for fuel. Heats to 2350° F. in 40 minutes. Non-oxidizing atmosphere. May be quickly converted into lead, cyanide or salt bath furnace. Send for new folder giving complete information.



Bennett
130 SOUTH ST.

INSURED STEEL TREATING CO.

NEWARK, N. J.

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St. Louis

April, 1942

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MODERN MACHINE SHOP

mediate visual detection; in sealing inspected parts for army material for protection until they reach the assembly line, and in sealing drums and containers for similarly effective protection.

#### Imperial Bundy Tinned Steel Tubing

A soft temper steel tubing which is copper coated and tinned and can be used to replace copper tubing for many purposes has been announced by The Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago, Ill. The tubing, which is known as Imperial Bundy Tinned Steel Tubing, can be used for gasoline and oil lines, machine tool hydraulic and lubrication lines, conduit tubing, connecting lines for oil burners, vacuum lines, refrigeration condensers, and so on.

The tubing is copper coated inside and outside and has an additional tinned coated on the outside. The tinned coating is said to enable the tubing to be used with regular compression, Hi-Duty and Type "D" fittings with assurance of a tight, leak-proof joint. The tubing can also be

used with flare and inverted flare at

Clutch

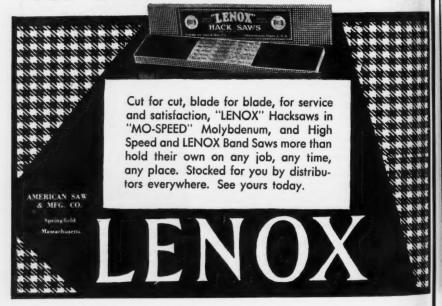
357 Car

Imperial Bundy Tinned Steel Tublar is soft tempered and can be bent flared, coiled, soldered, brazed, and welded. The tubing is unusually strug and has a high resistance to vibration fatigue. Bursting strength ranges from 17,800 to 8,700 lb. per square inch, depending upon the size of the tubing The tubing is furnished in 25-foot coil in ½, ½, ½, ½, fe, and %-inch O.D. size

#### Bakelite Sealing Solutions for Porous Castings

According to an announcement made by the Bakelite Corp., Unit of Unico Carbide & Carbon Corp., 30 E. 42nd 8t. New York, N. Y., porous or leaky metal and alloy pressure castings can be reclaimed by impregnating them with the Bakelite Sealing Solutions now being marketed by this firm. According to the manufacturer, these sealing solutions have proved highly satisfactory for many types of aluminum, nickel, silver, bronze, and brass castings, and are being successfully employed by aircraft, automotive, and electrical equipment manufacturers.

#### FOR EVERY METAL CUTTING JOB



2326

April, 1

# Clutch Type — Automatic Reverse TAPPING ATTACHMENTS

**ADVANTAGES** 

- Tightening one screw holds tap.
- Chuck jaw is selfcentering.
- 3. Weighs half as much as cone drive tapper.
  - 4. Requires no pressure. Operator merely follows lead of tap.

PROMPT DELIVERY

Write for complete information

#### DORMAN MACHINE TOOL WORKS

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New York, N. Y.

# CONTINUOUS HINGES

Manufactured by

AUTO MOULDING & MFG. CO.

2326 S. CANAL ST. CHICAGO
WRITE FOR STOCK LIST

LOOK AT THIS CHIP!

A 2-inch diameter drill in a Universal collet chuck turning only 160 revolutions per minute cut the chip here illustrated. And during this drilling operaton the drill did not slip in either a longitudinal or radial direction in the collet chuck. In addition to gripping as strong as solid steel itself. Universal chucks have ground threads and ample room for tool feed out. Write for further facts and prices.



## UNIVERSAL

Engineering Company Frankenmuth, Mich.

The use of Bakelite Sealing Solutions for porous castings is said to ensure the production of parts fully the equivalent of castings that pass the most exacting

inspection and tests. Proper treatment with the solutions, it is claimed, will assure that undersurface pores are tightly sealed, thus eliminating the possibility of costly breakdowns in service.

After being applied, Bakelite Sealing Solutions must be baked to bring out their best properties. Properly treated and baked, they form an inert seal which is said to be infusible and insoluble. The solutions are claimed to be unaffected by hot or cold water, steam, or temperatures up to 400 deg. Fahrenheit.

Two types of Bakelite Sealing Solutions are available; namely, BE-2106 and BV-1845. BE-2106 contains a filler which prevents shrinkage. This heavy solution is recommended for most castings where the porosity is somewhat open, particularly aluminum castings.

ings where the porosity is somewhat open, particularly aluminum castings. BV-1845 is a thinner solution and is recommended for castings where the porosity is fine, such as nickel, silver, bronze, and brass castings.

Speedex Wire Stripper

A small, sturdy hand tool for use in "skinning" and cutting solid or stranded wire, to be known as the



Speedex Wire Stripper

Speedex Wire Stripper, has been placed on the market by the Wood Specialty Mfg. Co., 221 Mead Bldg., Rockford, III. The tool is available equipped with blades for wire in sizes from No. 10 to 18, No. 12 to 20, and No. 16 to 24. WITI

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18, No. 12 to 20, and No. 16 to 24.

The jaws and cutting blades of the tool are of hardened steel and springs are of high quality music wire. All screws are case hardened and the tool is finished in dull nickel.

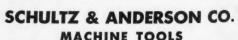
# SPECTOGRAPH

- For Accurate Toolroom Jobs
- For Tool Sharpening
- For Inspection
- For Precision Operations on Small Work

Use the Inspectograph to eliminate shadows and glare, to get higher accuracy on all types of fine work . . . for easier, taster inspection of small finished parts, for tool sharpening, for dozens of similar jobs!

Equipped with α 4" lens for rapid use, the Inspectograph has a soft, diffused fluorescent light inclosed in a conveniently shaped mounting. Shadows and glare are entirely eliminated no matter what shop lighting conditions are.

Model B (double bulb) \$26.40 net.



109 EDISON PLACE

NEWARK, N. J.



DIMENSIONS

11½" wide, 12" high, 10" deep, completely equipped, ready for instant use.

PROMPT DELIVERY!

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HOURS OF STEADY CHIPPING

WITHOUT REDRESSING!

 That's the record set by this BISCO Tool Steel chisel, chipping burrs from rough castings. Because our stocks are carefully chosen for durability, strength and wear-resistance, such service is typical of all BISCO Steel Products.

Call us for further information on your steel requirements.

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THE BISSETT STEEL CO.
943 East 67th St. Cleveland, Ohio - HEnderson 0995

Precision bores easily gaged by ordinary operators using

#### COMTORPLUG

POSITIVE ACCURACY GAGING BORES TO FRACTIONS OF .0001"

Sizes:

¼" to 7" dia. and larger

IDENTICAL RESULTS
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...BY INSPECTORS



This unique patented gage yields important advantages over limit gages. Shows EXACTLY the size of the bore to a fraction of .0001". Also detects out-of-round, front or back tapers, barrel shape, bell mouth, etc. Widely used by airplane, ordnance, automotive and all precision shops.

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THE COMTOR OO

65 Rumford Ave.

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COMET

BORING, FACING and INTERNAL THREADING TOOLS

For holes from 1/8" upward, 15 different sizes

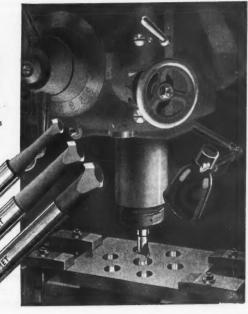
Made of Super-High-Speed Steel Specially Heat Treated

Indispensable for your JIG BORER. The worm-like spiral of the boring heads provides a long, useful cutting surface. Their use insures perfect fitting threads. Correctly designed for precision work.

Write for complete data.

COMET TOOLS, INC.

738 Broadway, New York, N.Y.





All-Electric Adjustable-Speed Drive for Monarch 10-Inch Toolroom Lathe

Designed to provide a wide range of speeds, an all-electric adjustable-speed drive for use with its 10-inch toolroom

Monarch 10-Inch Test room Lathe Equipment with All-Electric Ministrable-Speed Din

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lathe is announced by The Monard Machine Tool Ca. Sidney, Ohio. The drive consists of a control unit with start, stop, and set buttons, a l h.p. d.c. motor which is beltometed to the lath through a pulley keyed to the spidle, a speed-adjusting rheostat, and a master lever for starting, stopping.

and reversing the lathe motor itsell. Along with a control panel containing forward and reverse contactors controlled from the master lever on the heatstock, all of this electrical equipment concealed inside the base of the lathe. Spindle speeds (indicated in r.p.m.)

Spindle speeds (indicated in r.p.m.) are shown by a magnetic type tachon-

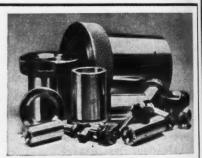
# STANDARDIZED DRILL JIG BUSHINGS

\* The chances are your bushing needs fit into the Acme standard line. Why? Because Acme offers A. S. A. (American Standards Ass'n.) standards, together with Acme standard bushings...the largest line of standardized bushings available. This reduces special requirements, yet, if your bushing needs are special, Acme is equipped to produce them reasonably fast.

#### **ROTATING SEAL DESIGN**

Right now, the Acme engineering staff is ready to help with your shaft seal problems . . . to improve your present seal, or design a complete new one.

To obtain the truly mated sealing surfaces



#### . FLAT LAPPING . . .

necessary for a really tight seal, Acme offers a lapping service that can finish surfaces to within .000005" (Five millionism inch) from absolute flatness. Their strict uniformity abolishes expensive re-assembly and re-testing of your finished product.

ACME ADVICE IS YOURS FOR THE ASKING

ACME

#### ACME INDUSTRIAL COMPANY

**Makers of Hardened and Ground Precision Parts** 

212 N. Laflin St.

Chicago, III.

MONroe 4122

n 10-Inch Too the Equipped 1-Electric M Speed Da

announcei Monard e Tool Co. Ohio, The onsists of a unit with top, and re ttons, a ! c. motor s belt-cono the lathe a pulley the spineed-adjust. stat, and

stopping. tor itself containing s control. the head. ipment is the lathe r.p.m.) tachom.

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#### April, 1942

#### MODEL No. 16 "SPECIAL"

Constructed as per Specifications of U. S. Naval Aircraft Factories

Reg. U.S. Pat. Off.

Beware of Imitations!

Our machine carries the

#### BUTTERFLY FILING and SAWING MACHINE

(Die Making Machine) This is a very heavy, powerful machine and is designed for extra heavy filing and sawing, but it performs small work just as well. This type of machine is usually adopted in

Butterfly trade mark. Ammunition Plants, Airplane Factories and machine shops where heavy and precision filing and sawing is desired. We also manufacture smaller models-Model D-10" Table; Model No. E.L .- 12" Table.

HARVEY MANUFACTURING CORP. 163 Grand St., New York Phone: CAnal 6-5170

# W D & W"

Styles  $7 \times 17$  and  $6 \times 13$ 



Developed to meet demand for chucks lower than our standard style.

Send for folder covering Chucks and Demagnetizers.

#### J. & H. ELECTRIC CO.

202 Richmond St. Providence, R. I.

SEND FOR FREE CATALOG

THE Kipp Air Tool Catalog has always been in great demand because it is an "open book" - easy to understand and factual.

The 1942 Catalog now available is to a degree a War issue. One new super model H grinder, for instance, replaces several former models both in the interest of conservation and of better service to industries engaged in war work.

The 1942 Kipp Air Grinder Catalog is yours for the asking.

#### GRIND

AND OTHER TIME-SAVING POPULAR AIR TOOL ACCESSORIES

Kipp Air Tools give you highest speeds, lowest prices and have proved indispensable in thousands of tool rooms and production departments. Please attach preference rating certificate with order. Model H Grinder sells at \$29.78, Model K \$39.78 and Model VT \$49.78. U.S.A. Prices, F.O.B. Madison.

MADISON-KIPP CORPORATION

20% WAUBESA ST., MADISON, WIS., U.S.A.

## It Goes Without Saying

present day conditions demand highest possible efficiency of every tool and machine.



Everyone connected with metal cutting and shaping knows that correct and frequent grinding of tools is absolutely necessary. You would never allow a mechanic to use a dull broach or a dull drill. You require that all tools be sharp before using and be reground the moment dullness begins.

THIS NECESSARY PRACTICE HAS BEEN NEGLECTED IN REGARD TO POWER HACK SAW BLADES. THIS NEW METHOD OF GRINDING BLADES NOT ONLY INCREASES CUTTING EFFICIENCY BUT EFFECTS GREAT SAVING IN BLADES AS WELL.

Industrial Engineering Co., Inc.
P. O. Box 433, 311 Sixth Avenue, South
MINNEAPOLIS • MINNESOTA

eter flush-mounted on the front of the lathe headstock where it is plainly visible to the operator.

visible to the operator.

The heart of the adjustable-speed intem, the V-S control, consists of a conscience of the consists of a conscience of the conscience of an excite and generator mounted on the same shaft with an a.c. motor which drue them. The exciter provides constant voltage to supply the generator and motor fields. Speed adjustment of the lathe motor is obtained through what might be called a tandem rheostat, on section of which is connected into the generator field circuit and the other into the field of the lathe motor. The rheostat, mounted inside the base of the lathe, is manually controlled by a small knob or handwheel brought through the front of the lathe at a point convenient to the left heart of the convenient.

to the left hand of the operator. Six to one ratio back gears have been incorporated as an integral part of the driving motor to provide additional power for cutting at low speeds. These back gears make it possible to utility the full 3 h.p. of the lathe motor and only at the higher spindle speeds but also from 400 r.p.m. down to 4½ r.p.m. as well. The overall range of spindle speeds is from 4½ to 2,500 r.p.m. The spindle can be driven either directly by the motor or through the back gean which are engaged by means of a level located on the front of the lathe immediately adjacent to the speed adjuste knob.

#### Matthews Steel Stamp Holder

Developed primarily for safety in producing hammer struck stamp impressions on steel products, a steel stamp



Matthews Steel Stamp Holder

holding device is announced by Jas. H. Matthews & Co., 3942 Forbes St., Pittburgh, Pa. The stamp holder can be used for stamping round or flat products. The base of the holder is V. shaped to provide right angle alignment of stamp when stamping round prof-

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#### Send for **Ualuable** Booklet

## Forgings for All Industries

Rough Turned or **Finished Complete** 

Composite Die Sections, Extrusion Tools, Crankshaft Forgings, Gear Forgings, Die Cast-

Rings, Discs, Blocks, Shafts, Hubs, Bars, and Special Shapes. Tool Steel of All Makes. S.A.E. Specifications.

Stainless and Copper Forgings.

MAY WE SERVE YOU?

#### AJAX STEEL & FORGE CO. DETROIT, MICHIGAN

205 ADAIR ST.

# PERFECT POINTS



Trim your drill costs with a STAR Precision Drill Grinder. Write for Folder.

#### Star Machine & Engineering Corp.

Division Star Electric Motor Co., BLOOMFIELD, N. J.



ROGERS "NT" KNIFE GRINDER

SAVES TIME 90", 110" 134"

A massive, rugged cabinet base grinder with extra large V way, forced feed lubrication, disc type clutch transmission, segmental grinding wheel and other dependable Rogers features. Exceptional performance!

Send for NT Circular. Please give maximum length of knives. SAMUEL C. ROGERS & CO. 213 Dutton Ave., Buffalo, N. Y.

ROGERS KNIFE GRINDERS

PRECISION

QUALITY SINCE

ucts. The stamp is held in place by means of a "Shepherd Hook" holding device, and floats up or down in order to find its own location on varying diameters of round or oval

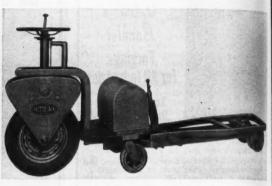
shapes.

An outstanding advantage of the holder is found in its foolproof factor, in that it cannot be used upside down. The holder, it is claimed, can be held at any angle or in any position with no effect on satisfactory stamping. According to the manufacturer, stamps cannot drop out when not in use nor will they bounce out from rebounds caused by forceful hammer blows. The very nature of its holding method permits the stamp in the holder to be in contact with the part

to be stamped when a hammer blow is delivered, thus assuring a thoroughly

legible impression.

The Matthews Steel Stamp Holder can be made to hold any size steel stamp, Holders from which stamps cannot be removed are also available. In this case, the steel "Shepherd Hook" is replaced by a steel pin that is peemed at both ends, assuring a firm seal.



Motorjack Power-Propelled Truck

#### Motorjack Power-Propelled Truck

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Built for the rapid transportation of merchandise and parts between deparments in factories, warehouses, and an on, the Motorjack Power-Propelled

SIMPLIFIED INTERNAL GRINDING with the MAJESTIC INTERNAL GRINDER



An exceptionally wide range of internal grinding jobs can be handled on the New Majestic Internal Grinder. Its simplicity of design and ease of operation are features of utmost importance in providing maximum grinding output at low cost.

#### SPECIFICATIONS

Length of table, 48". Swing over table, 10". Travel of cross slide, 21/2". Frecision dial graduated to .0001". Precision bearing work head. Speeds — 100, 225, 350 r.p.m.

Write for complete details contained in New Bulletin

Majestic Tool & Mfg. Co.

2950 E. Woodbridge

Detroit, Mich.

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#### For Profitable **Punch Press Production**



The Dickerman Hitch Feed can be installed and a person and a purch freed can be installed on almost any type of punch press and is built to feed from any position on any style die. Although feed can be attached to bolster plate of press, it is usually affixed to die-set as a permanent mechanism for that particular die.

Because of positive feed control, Hitch Feed can be adjusted to feed from 0 to its limit (2" on 2" Hitch Feed and 4" on 4" Hitch Feed) for each stroke of the press.

Write for folder No. 84

H. E. Dickerman Mfg. Co. 321 ALBANY ST. SPRINGFIELD, MASS.

#### WHITNEY-JENSEN TOOLS

No. S 129 & 130 POWER PUNCH PRESSES

Capacity 10 tons. Length of stroke, 11/4". Stroke adjustment, 134" Die space stroke down, adjustment. up 6". Depth of throat, No. 129, 12"; No. 130, 18".



Whitney Metal Tool Co. 110 FORBES ST. ROCKFORD, ILL

#### IAMONDS FOR DEFENSE



FOUR FIELDS FOR VICTORY ON LAND - IN THE AIR - ON THE SEA and - IN THE SHOPS



BATTLE OF PRODUC KARELSEN DIAMOND TOOLS

**Better Quality - Faster Service** 



#### SALESMEN WANTED

Write for Territory. Big demand for our products. State qualifications fully. All information in confidence.



E. KARELSEN, INC. 54 W 45TH-ST. NEW YORK, N. Y. TOL VAN 6 5688

# BURKE MILLING MACHINES



No. 4 Motor Driven MILLING MACHINE
Mounted on Cabinet Column

Burke motor driven milling machines Nos. 1, 2, 3, and 4 are specially suited for handling small, difficult work on a production basis.

Write for complete information.

BURKE MACHINE TOOL CO.
297 E. 16th St. Connecut, Ohlo

Truck illustrated herewith has been brought out by the Milner-Raber Co. New Castle, Ind. The driving wheel and in reality, an automobile wheel and tire. The hub is specially made and in mounted on anti-friction bearings on a shouldered spindle bolt.

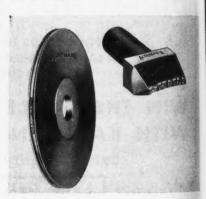
The power for driving the truck is provided by a centrally mounted gas engine or electric motor. On the motor shaft is a gear of 32 teeth, meahing with two gears of 96 teeth and supported on shafts running through each fork plate. On these two cross shafts are two concave spools of malleable iron which roll on the periphery of the tire, providing the drive.

By turning the steering wheel is deg., forward or reverse direction can

By turning the steering wheel 18 deg., forward or reverse direction can be obtained without the use of a reversing motor or shifting gears. The 4 h.p. motor with which the unit is powered provides a speed of 3.9 miles produce at full load of 4,000 lb. and an amperage draw on the 12-volt series multiple batteries of well under 4 amperes.

#### Acromark Marking Roll and Press Stamping Die

The Acromark Corp., 9 Morrell St. Elizabeth, N. J., is now marketing a special engraved roll die for marking



Acromark Marking Roll and Press Stampler

wire, welding rods, and other round materials, and a curved line press stamping die for marking discs, the ends of cylinders, shaft ends, gear hubs, and any part that can be marked

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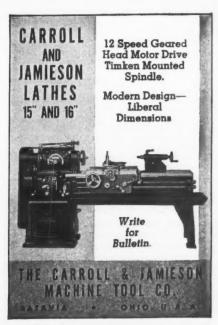
#### BETTER RIVETING LOWER COST

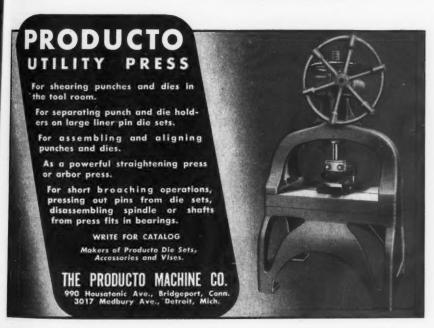
#### **LINLEY Noiseless Rotary Rivet Spinning Machine**

Made in a wide range of sizes and types for iron or cold rolled steel rivets up to 3/5". Also larger rivets of softer materials. 31/2% chrome nickel steel spindles, heat treated and ground are supported at lower end in a double row radial thrust bearing which carries radial load AND riveting thrust load.

Write for complete details.

LINLEY BROS. CO. 15 Montauk St. Bridgeport, Conn.





on the end of the hub, shoulder, or on

the periphery.

The marking roll is concave or grooved on the face to enable wire, rods, or tubes to pass underneath it, and is engraved with raised lettering or numbering for impressing the desired marking. The diameter of the roll determines the distance between marking intervals. In use, the roll is held in a fixture which permits adjustment to a constant pressure sufficient for marking and for rotating the roll die by friction contact only.

The press stamping die is designed

for use in the ram of a 10-ton of heavier punch press. A guide for positioning the part to be marked on a stamping block on the press bed completes the setup. By guiding the part so that the mark is stamped in the center of the most uniform flat surface no damage to the part is said to result and a perfect mark is said to be obtained.

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Acromark Marking Rolls and Press Stamping Dies can be made to suit in dividual requirements.

#### Intake Flange for "Dustkop" Dust Collector

A two-way intake flange designed to increase efficiency and to permit the use of a 3-inch hose with its "Dustkop" Dust Collector to qualify under certain state codes specifying a minimum hose size has been announced by the Agel-Detroit Mfg. Co., 935 Book Bldg., Detroit, Michigan.

Intended for use with any of its line of self-contained dust collectors, which are recommended for bench, tool, surface, and similar small wheeled grinders, the flange is installed on the from



#### DRILL SHARPENER

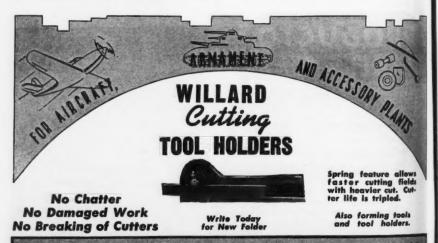
Saves Time and Money...Conserves Materials to Aid in Victory MAKES OLD DRILLS LIKE NEW

Anyone can do expert drill grinding with this simple-to-use drill grinding attachment—fits any bench grinder—saves buying new twist drills—saves time and materials that dull bits waste. Grinds bits from to 1½. Write for FREE literature.

T & H MFG. CO.

811 E. 31st St.

Kansas City, Mo.



AUTO-ORDNANCE CORPORATION

Manufacturers of the THOMPSON Sub-Machine Gun



1437 RAILROAD AVE BRIDGEPORT, CONN

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GIANT for WORK!

#### THE WONDER CUTTER

Cuts wire, rods or band iron easily and quickly. Any size wire or rod up to % inch round or % inch square and band iron up to 1/8 by 2 inches. Its small size and low price makes it possible to have more than one, mounted wherever convenient. Gauge can be set for repeated cuts of same length on both wire or band iron. FREE TRIAL in your own shop. Write for further information and prices.

The Federal Foundry Supply Co. 4606 East 71st St. Cleveland, Ohio

#### GRAHAM MULTI-PURPOSE VISE Sold with or without the Jig Attachments shown



Finished flush to accurate parallels and right angles, fitted with Jig Attachments if desired, this Vise is extra handy for general machine work, and a jig-saver for repeat operations on miller, driller, planer, shaper, grinder. Request illustrated price circular.

Jig Attachments can be added at any time

GRAHAM MFG. CO., INC. 37 BRIDGE ST. EAST GREENWICH, R. I.

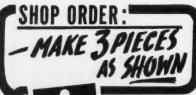
Production too Vital Metals too Essential to risk the waste of both, because of faulty lubrication or cooling. YOU CAN DESEND FISON

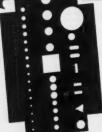
ONEER ENGINEERING MANUFACTURING CO.

19647 JOHN R ST.

DETROIT

MICHIGAN





12 gauge (.109) mild steel 18" x 24"

16 different dies used, requiring 16 turret positions

Set up time—5 minutes, 6 seconds

Time to pierce 41 openings including tarret rotation — 7 minutes, 24 seconds 7 me to produce first piece — 12 minutes, 30 seconds

#### WITH WIEDEMANN TURRET PUNCH

12/2 MINUTES - FOR 1st PIECE
7/2 MINUTES - EACH FOR 2nd
AND 3rd PIECES

The almost unbelievable fact is that this one job—from blank to finished piercing—took just 12½ minutes—the result of the time saving Wiedemann Gauge Table and Turret Punch Press.

The material is handled to predetermined positions by the operator — Turret construction makes required die instantly available — and the press pierces the material—accurate to  $\pm$  .007".

There is a size and capacity for every use
—Short run jobs can be produced at long
run low cost. Be sure to write for full
details on the models and types of
Wiedemann Turret Punches. Get the proof
of short run piercing efficiency.

WIEDEMANN MACHINE CO. 1821 SEDGLEY AVE. PHILA., PA.



or intake side of the unit directly over the opening in the cabinet in front of the multiple blade fan. While sufficiently compact to conserve needed space the flange will admit the ends of two pieces of 3-inch diameter flexible metal hose. The other end of the hose is con-



Intake Flange Applied to "Dustkop" Dust Collector

nected with the guards of the grinding wheel or, in the absence of a conventional guard, a sheet metal intake hood can be supplied.

In operation, the dust and dirt drawn from the hood through the hose and into the intake flange pass through the multiple bladed fan and through a horizontally placed spun glass filter. The filter stops the dust, which falls back into a removable pan, and the cleaned air is returned to the room, thus resulting in a saving in heating costs. The holes in the flange are sufficiently depto hold the hose without other means, and connecting and disconnecting of the hose requires no tools.

OPITICAL COMPARATORS

MILLING MACHINES

ROTARY SURFACE GRINDERS

Write

PORTMAN MACHINE TOOL CO.

17 Beechwood Ave.,

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# ANDERSON BALANCING WAYS Pillow Block Type



A sub base can be made of proper height to give necessary clearance for large diameter work.

Supersensitive ball bearings and hardened and ground spindles assure accuracy.

Write for details.

ANDERSON BROS. MFG. CO.

1926 KISHWAUKEE ST.

ROCKFORD, ILL.

MARK IRON, STEEL and Carbides



# Etchograph

Mark tools, dies, gages and fixtures of any ferrous metals including the hardest allows and carbides—quickly—plainly.

Three sizes to meet all requirements. Also a combined Etchograph and Demagnetizet.

Write for circulars and prices.

40 CHURCH ST.

NEW YORK

# SPEED UP

TOOL SHOP PRODUCTION

For heat treatment of tools, dies, precision parts ... A modern Despatch Pot Type Furnace in the shop will eliminate important production bottlenecks. It is always available at any temperature needed ... Has absolute temperature control at any point in the range 275° F. 1250° F... It is compact to fit in any convenient space. No waiting ... No uncertainty of results, Full production speed without heat treating delays.

WRITE FOR BULLETIN 81-R



275° F. - 1250° F. 24 Standard models to suit every need.

DESPATCH OVER

April, 1942

MODERN MACHINE SHOP

#### Lyon Steel Workbench

A heavy duty steel workbench which is said to have a diversified use due to an addition of several new and improved accessories is announced by



Lyon Metal Products, Inc., Clark St.,

Aurora, Illinois.

The bench may be equipped with single drawer, two or three-shift drawer units for multiple shift operations, half depth shelf, full depth shelf, back and end stops, foot rest, or full length bench riser. The channel-type stringer illustrated is used only when the bench has no shelf. Shelves and stringer are made in one piece in order to obtain

added strength and rigidity.

#### Valdura Black-Out Paint

Havi

A black-out paint for use in darkening windows and skylights of industrial and commercial plants where it would be impractical to extinguish lights at the sound of an air-raid warning has been announced by the American-Marietta Co., 43 E. Ohio St., Chicago, Ill. The paint, which is known as Valdura Black-Out, is being marketed in paste form and, when cut 50 per cent with water can be sprayed or brushed on window to prevent all passage of light. Cover. age is 800 square feet to the gallon.

Valdura Black-Out Paint is said to

dry within 40 minutes after application, providing a flat surface which, it is claimed, will not flash back or glare when struck by artificial light used within a room. In interior applications where large glass surfaces make the higher reflection properties of a white surface necessary, a single coat of Val-dura Black-Out Paint may be covered with a white paint.

Valdura Black-Out Paint can be removed without damage to glass, and is supplied packed in one and five-gallon containers.



In transportation, as in every other essential industry the need is for more and more production. We must hury. If you can make things faster you can make more things C-F Welding Positioners speed up welding production because they cut down handling time and increase weld-ing time. They permit "downhand" welding at every point with just one set-up, positioning top, bottom and sides with push-button control. C-F Positioners may be your best way to speed up the welding production schedule. Write for Bulletin WP 20.

#### CULLEN - FRIESTEDT CO.

1311 S. Kilbourn Ave. ILLINOIS CHICAGO

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Having difficulty holding tolerances?



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Floating Holder for

TAPS and REAMERS

• Automatically com-

 Automatically compensates for machine spindle misalignment, eliminating over-sized or bell-mouthed holes.

 Helps produce unbelievable accuracy on both new and old equipment.

• Furnished with male or iemale taper, straight, threaded or special shanks to fit any machine used for tapping or reaming.

W. M. ZIEGLER TOOL CO.

1926 Twelfth Street

Detroit, Michigan



Designed to use a larger diameter bar than formerly used because the chip is cut in front to make room for the bar. This gives you rigidity, higher boring speeds and heavier cuts.

SEND FOR DESCRIPTIVE FOLDER.
Representatives in all principal cities.

EVEREDE TOOL CO.

180 N. Wacker Drive Chicago, Ill.

DO YOUR MEN KNOW ALL THESE ANSWERS?

Give them these helpful hints from "Metal Cutting"—free 20-page VICTOR book-let that helps you get the most from the blades

HAND HACKSAW BLADE TROUBLES

you buy.

Breaking at holes at ends: Cause—too much tension on blades; Cure — go easy on the thumbscrew at end of frame.



Breaking of body in middle: Cause — not enough tension on blade, allowing it to twist, bend, cramp and jam; Cure—set up frame thumbscrew tighter or use a sturdier frame if necessary. Cause No. 2—using a new blade in an unfinished cut begun by an old blade; Cure—turn the work over and start a new cut that will meet the old cut.



Crooked cuts: Cause—set worn off teeth; Cure—try a new blade. Cause No. 2—blade out of alignment; Cure—use a sturdier frame that will neither bend permanently nor give under pressure. Cause No. 3—pressure too great; Cure—limit the pressure to what your wrist can take, not to what your shoulder can give.





This 20-page, pocket-size booklet is liberally illustrated and packed with valuable tips on selection, use and care of hand and power blades and frames. Ask your Mill Supply Distributor or write us for as many copies as you need.

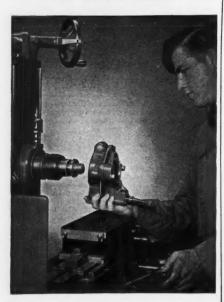
VICTOR SAW WORKS, Inc.

Middletown, N. Y.

**D2394** 

# LIBERTY GRINDING ATTACHMENT

Gives Your Surface Grinder an Extra Hand



Easily attached to most surface grinders to eliminate expensive set-up time where small wheels are necessary. Grinds slots, recesses and surfaces, etc., which are impossible to reach with large grinding wheel.

Accurately handles a wide variety of tool, gage, die and other grinding jobs. Assembled complete with any size bores, pulleys, belts and grinding wheels at no extra cost.

Write — specifying diameter of spindle head, type and make of grinders.

Liberty Tool & Gage Works
235 Georgia Ave. Providence, R. I.



Speed-Jack Variable Speed Reducer Complete with Remote Control

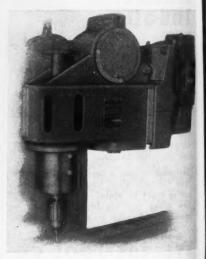
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#### Speed-Jack Variable Speed Reducer

The Speed-Jack Corp., 52 Bellavista Ave., Belleville, N. J., has placed on the market a variable speed reducer to be known as the "Speed-Jack." The unit can be operated from a hand dial or by remote control, which would enable machine tool manufacturers to build the reducer directly into a machine and thus make it a part of the construction. According to the manufacturer, the Speed-Jack is easily operated and can



Speed-Jack Variable Speed Milling Head Mounted on Horizontal Milling Machine for Vertical Milling

#### MILWAUKEE SURFACE PLATES



#### J. C. BUSCH CO.

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Engineers and Machinists Since 1907
126 E. PITTSBURGH AVE., MILWAUKEE, WIS.

YOUR FIRST LINE OF

**DEFENSE** against

HIGH SHARPENING COSTS No. 57T

Automatically Sharpens Metal Saws in gangs up to 8" in diameter.

in diameter.

Takes gangs up to

31/2" thick. The saws
are automatically indexed and sharpened
within variation of
plus or minus .001 of
exact diameter of
entire lot.

Write for Folder 571.

THE WARDWELL MFG. CO.



#### AUXILIARY STOCKROOMS

- Wherever You Need Them!

STACKBIN sections will give you a Stockroom wherever you want it—quickly and easily as building a sectional bookcase. These patented sectional storage bins nest together without the use of tools—cost you nothing to build, nothing to move. Find out today how STACKBINS can lower YOUR handling costs.

Write to
STACKBIN CORPORATION.
33 Troy St., Providence, R. I.

STACKBINS

April, 1942

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1942

MODERN MACHINE SHOP

be very simply introduced on machines already in use, since its unusual construction enables it to be placed in practically any position. The remote control feature is designed to make pos-

sible unlimited applications.

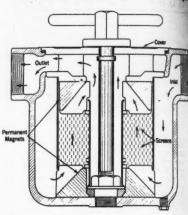
A vertical milling head into which a Speed-Jack Variable Speed Reducer has been built is also being offered by the company. The head is simple in design and can be easily attached and removed. Designed for both milling and drilling operations, the head is so constructed that it need not be removed from the milling machine overarm but can be moved to one side so that horizontal milling operations can be performed without interference. The head ean be operated at any angle up to 90 deg. at various speeds.

#### Frantz Model PQ-6 Permanent Magnet FerroFilter

The S. G. Frantz Co., Inc., 161 Grand St., New York, N. Y., has developed a permanent magnet FerroFilter which is said to have a greater capacity than any previous FerroFilter of this type. Designated as the Model PQ-6, the unit

is 15% inches high, has a 3-inch pipe connection and a capacity of 200 gallons per minute.

The Model PQ-6 is said to be espa-



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Frantz Model PQ-6 Permanent Magnet FerroFilter

cially adapted to the removal of harmful fine iron and steel particles from

DO FAST, ACCURATE TAPPING ON YOUR DRILL PRESSES . . .

# with Ettco-Emrick



mailed at your request.

ETTCO TOOL CO., Inc.

598 Johnson Ave., Brooklyn, N. Y.
DETROIT CHICAGO

MAKERS
OF ETTECK DRILL CHUCKS . TAP CHUCKS . TAPPING ATTACHMENTS
MULTIPLE TAPPING AND DRILLING HEADS . TAPPING MACHINES

SIZES

for

No. 0 to 1" Taps



#### SAVES LABOR

You will eliminate many costly hours from rour Payroll by using the JACKSON TIME-SAVING VISE. It saves the time wasted by your Machinists in hunting for Bolts, Clamps, Angle Plates, etc., when rigging up work on the Drill Press, Miller, etc. Of still greater importance is the saving in output you effect by not having your productive machine standing idle during the rigging up process, for the—

#### JACKSON TIME - SAVING VISE

by means of its revolving jaw and supplementary jaws instantly holds the thousands shapes that arise in machine work.

SEND FOR BULLETIN No. 23-M.

BROWN ENGINEERING CO.

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READING PA

# Mark It Quickly with a NUMBERALL



NEW Quick Set Machine. One wheel can be turned quickly by knurled knob for consecutive numbering.

NUMBERALL STAMP & TOOL CO.

Huguenot Park, Staten Island, N. Y. ★ The Best Conservation is LONG SERVICE



Work Surface of TOOL STEEL ... easily replaced



When you replace Parker Steel jaws you replace the entire working



The entire top (work surface) of a Parker Vise is protected by long wearing tool steel. This

means longer life, better and more accurate holding of work.

After long, severe service, if the jaws wear down or are damaged there is no need to throw the vise away. An entire new working surface can be provided easily by replacing the tool steel jaws.

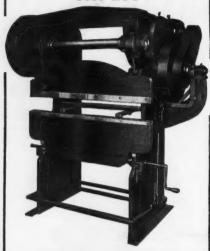
Save materials, save time, save money... use Parker Vises for better bench work. The Charles Parker Company, Meriden, Connecticut.

**Handled by Leading Distributors** 

PARKER VISES
AMERICA'S OLDEST

#### CHICAGO STEEL PRESS

No. 253



## SPEED WAR PRODUCTION OF SHEET METAL WORK

USE FOR . . .

1. FORMING

2. EMBOSSING

3. MULTIPLE PIERCING

4. NOTCHING

5. BLANKING

of Ammunition Cases, Bomb Box Liners, Bomb Fins, Aircraft Parts and Many Other Offense Products.

The No. 253 CHICAGO STEEL PRESS is accurate, compact, and ruggedly constructed of highest quality materials. Sizes 4, 5 and 6 ft. capacities up to 10 gauge.

Write for Circular No. 255

# DREIS & KRUMP MFG. Company 7418 LOOMIS BLVD.

CHICAGO

ILLINOIS

circulating coolant systems of machines used in tapping, grinding, deep had drilling, reaming, rifling, and so a also from circulating lubricating oil systems of pumps, Diesel and blooming mill engines, rod mills, roll grinden and so on.

#### Torit Cyclone-Type Dust Separator

The Torit Mfg. Co., 296 Walnut & St. Paul, Minn., is now marketing a cyclone-type dust separator for collecting dust from grinding and polishing wheels. The unit is available for use

with or without filter bag collectors and draws dust-laden air from hoods surrounding polishing and grinding wheels, and

so on.

Through centrifugal action, a high percentage of dust (75 to 95 per cent by test) entering the dust separator falls into the bottom chamber. The small amount that does not separate from the air stream inside the separator is exhausted through a center pipe having its outlet on top of the unit. The captured dust can be easily removed when necessary through a door in the dust chamber - the only cleaning that is necessary.

Where filter bag collectors are used and there is a possibility that the bags will be overloaded by the great volume of dust to be collected or

to be collected, or clogged from sticky buffing lint, a combination filter bag cabinet and cyclome separator is advisable. Since the separator would catch 75 to 95 per cent of the dust, only the finer particles would pass through the filter bags. As a result, maximum suction would be maintained longer and the filter bags would not require cleaning as often.

The Torit Cyclone-Type Dust Separator is equipped with a ½ h.p., 3,60 r.p.m., end-mounted motor, fan, and housing placed on top as shown.



Torit Cyclone
Type Dust
Separator

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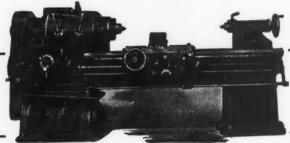
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**BOYE & EMMES** 



THE BOYÉ & EMMES MAC CINCINNATI

MOREPRODUCTION Cullman DRIVES MOTOR

War efforts demand the maximum output from every machine. Cullman Motor Drives modernize old style overhead drive lathes, screw machines, and similar equipment, resulting in 25% or more increased efficiency.

You can prove this in your own plantwithout any obligation. You may try a Cullman Drive for 60 days—and return it if not satisfied. There are Cullman Drives for motors from 1/4 to 15 H.P. Write at once for complete information.



CULLMAN WHEEL CO. 1352 V ALTGELD STREET CO. CHICAGO, ILLINOIS

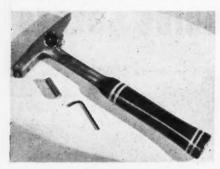
April, 1942

MODERN MACHINE SHOP

293

#### New Method All-Steel Inspector's Hammer

Ruggedly designed for continuous service, an inspector's hammer in which



New Method All-Steel Inspector's Hammer

the stamps can be easily interchanged is now being offered by New Method Steel Stamps, Inc., 149 Jos. Campau, Detroit, Mich. The hammer is of 1-lb. weight and of all-steel design, with shank forged integrally with the head

and extending through the hands which is of compressed rawhide, heavi ly lacquered. Head and shank are for ished on all surfaces.

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April,

The hammer is available with heat accurately drilled for round stam ranging from 1/8 to %-inch diameter in clusive. Stamps are held in place by standard size flush-type set screw, to which a wrench is supplied with and

Practically any conceivable character design may be had for the interchange able stamps, including symbols, letter, numerals, insignia, trade marks, and a on, with or without borders. stamps carry the Newco bevel, which is said to add to their ability to withstand severe use without chipping or breaking down the marking characters.

#### Simmons No. 1-A Micro-Speed Milling Machine

Designed especially for the rapid production of small parts such as those used in airplane, automotive, and other relative forms of manufacturing, the Simmons No. 1-A Micro-Speed Milling Machine illustrated herewith is now be



	9"			97.00
1	2"			160.00
1	5"			185.00
1	8"			220.00

**Heavy Duty** 

18" . . . . 350.00 21" . . . . 500.00

25" . . . . 590.00

FAST DELIVERY GUARANTEED

Our rotary table will take the place of a costly fixture. It is used for all kinds of work on milling machines, shapers, drill presses and horizontal boring mills.

Send for literature and details.

WE CAN ALSO FURNISH DIVIDING **ATTACHMENTS** 

LAFAYETTE TOOL & SUPP NEW YORK, N. Y. 178 LAFAYETTE ST.

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with head and stamps diameter in place by a screw, for with each

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The New WILTON Precision SCREW VISE



Entirely new construction. Securely enclosed precision spin-de — dustproof. No dead motion. Greater holding power. monon. Greater nothing power.

Transtricted year's guarantee. Used by
International Harvester. Buick Aviation Plant.
Allas Powder Company. War Dept. and
other delense factories.

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TOOL CORPORATION

Well. 7232 Wrightwood Ave.,

Chicago, Ill.

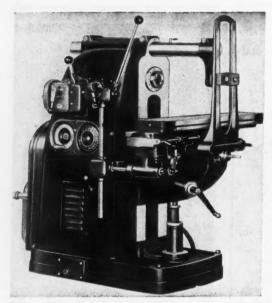


JINAIUNI — GUNVES — ANULES Beverly Throatless Shears cut metal flating—ACCURATE—no waste, no distortion. Made of finest steel—PROFITABLE—INEXPENSIVE! Will last a lifetime!
No. 1—cuts 14 gauge—wt. 16½ lbs.
No. 2—cuts 10 gauge—wt. 33 lbs.
No. 3—(With ball bearing holddown device) cuts A inch mild steel and 10 gauge stanless steel, wt. 55 lbs.

BEVERLY SHEAR CO. 3004 W. 111th St.

Chicago, III.

ATLANTIC This new steel shape furnishes a convenient, positive grip for chisels, punches, cutters and blacksmiths' tools. This shape minimizes chipping and splintering. Drawing of temper to suit different requirements is unnecessary and com-pletely eliminated. Suitable hardness is obtained by merely heating the tool and quenching it in water. ATLANTIC STEEL CO. 1775 BROADWAY, NEW YORK, N. Y. Developers of Non-Tempering Tool Steel



Simmons No. 1-A Micro-Speed Milling Machine

Troy

Verv

ing marketed by the Simmons Machine Tool Corp., 1745 N. Broadway, Albany, N. Y. The column and base are a one-piece close-grained casting of suitable proportions to provide the necessary rigidity under heavy loads. The drive is through a Simmons Micro-Speed Drive Unit, which is housed in the column and is available in either 2 or 3 phase, 25, 50, or 60 cycle 220, 400, 440, or 550-volt alternating current.

The motor is built integral with the main drive unit, and by means of the variable speed Micro Unit, an unlimited range of selective speeds to the spindle can be obtained. The control is through a selector dial handwheel located within

easy reach of the operator all times.

The spindle is made fur forged alloy steel, heat treated and ground to size, and is prided with a No. 40 standardized flanged spindle nose. The spindle is driven through multiple V-belts and runs on Timitar precision tapered roller bearings having adjustment from the rear. All shafts in head and feedbox run on anti-friction bearings.

The saddle and knee are as curately hand scraped to perfect alignment on long dowin slides. Those on which the kneemoves vertically are cast integral with the main column. My justable gibs are provided for alignment and take-up in case of wear.

The table, which is supported on extra long double V-slides cast in the saddle, is provided

with adjustable gibs to compensate to wear. The table is provided with larged pockets and three T-slots for the entire working surface. Positive automate longitudinal power feed is supplied to the table, and all feeds are equipped with adjustable dials graduated to the sandths of an inch.

Standard equipment of the Simmon No. 1-A Micro-Speed Milling Machine includes harness, knockout rod, cran handles, wrenches, motor, multiple videriving belts, magnetic controller with overload and undervoltage protection and start, stop, and reverse push-button station. Optional equipment include motor-driven lubricant pump with physical station.

### "Taps Sharpened on a J-B TAP GRINDER Thread 5 Times as Many Holes



One manufacturer sharpens his taps on a J-B Tap Grinder every 2000 holes and threads 40,000 holes with each tap. (Formerly his taps became unusable after threading only 800 holes.)

New taps are scarce—retain the size and extend the life of your tap by sharpening them on a J-B Tap Grinder.

Write for Folder M.

### **EDWARD BLAKE COMPANY**

634 Commonwealth Ave., Newton Centre, Mas

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Simmons Machine , crank tiple Ver with tection. -button ncludes th pip-

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### Troyke Rotary Tables **Yery Quick Deliveries**



Sizes 9", 12", 15", 18", 21", 25" Ask your dealer or write us for eight page catalog.

ALFRED A. TROYKE

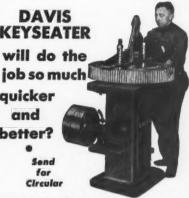
4422 Appleton St. Cincinnati, Ohio

Why Use A Shaper to cut Keyways when a

DAVIS KEYSEATER will do the **quicker** and

> Sond for Circular

better?



DAVIS KEYSEATER CO.

Exchange and Glasgow Sts. ROCHESTER, N. Y.



Speed Up MILLING. DRILLING. ASSEMBLING

For small parts production work. Three sizes: 4", 5", 7". Send for information to Dept. A.

FENN MANUFACTURING CO. HARTFORD, CONNECTICUT

ing, vertical attachment, plain dividing heads, slotting attachment, and arbors.

Specifications of the machine are as follows: working surface of table, 36 x 8½ inches; longitudinal power feed, 34 inches; cross feed, 8 inches; vertical feed, 18½ inches; center line of spindle to floor, 44½ inches; center line of spindle to top of table, maximum, 16½ inches; column to overarm brace, maximum, 16½ inches; column to arbor support, maximum, 20½ inches; column to arbor support with overarm brace, maximum, 13½ inches; diameter of overarm, 3¼ inches; center line of

The Model A603 Chip Breaker Grinder is another Knock-Out to add to a long line of fine machine tools. Its 11-inch longitudinal table movement makes it ideal for manufacturing operations. The addition of a tilting table attachment makes it capable of complete maintenance of carbide-tipped tools.

Write for CBG42-4M and List of Users.

### K. O. Lee Company

Aberdeen, South Dakota, U. S. A.

spindle to underside of overarm, sinches; spindle, No. 40; diameter a spindle nose, 3½ inches; size of hole spindle, 21/32 inch: speeds, low gear to 170 r.p.m., high gear 210 to 3 r.p.m.; number of feeds, 6; range, per revolution of spindle, standard 0.011 b 0.074 inch, special 0.006 inch minimum net weight, approximately 2,800 h, shipping weight, approximately 3,00 pounds.

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#### "Speedgrip-Automatic" Adjustable Nut Wrench

The Pack-Rite Machine Corp., 828 N Broadway, Milwaukee, Wis., is now manufacturing the "Speedgrip-Auto-



"Speedgrip-Automatic" Adjustable Nut Wrench

matic" Adjustable Nut Wrench show in the accompanying illustration. The wrench can be quickly adjusted to as size nut or bolt by merely flipping the handle band up or down on the hands shaft. The jaws, which are designed to produce a vise-like grip, are self-locking and, it is claimed, cannot slip because of their unique construction. In addition, the jaws are said not to bim when released.

Designed for operation with only one

# Sharp Edge CUTTING DIES and PERFORATING DIES

For Paper, Leather, Rubber, Celluloid, Cloth, Fabrics, Etc. Gasket Dies Our Specialty.

HEATH MFG. CO., INC. 218-222 LAFAYETTE ST., NEW YORK, N.Y.

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With considerable experience and excaptional facilities for the manufacture of high precision Small Gears, our manuincluring capacity is now heavily burdened with National Defense work, and we naturally feel pardonable pride in the importance and quality of our contributions to the Program.

While this very essential work takes precedence, we are keenly conscious of our duty to established customers; their needs must command our continued earnest efforts. Under such circumsignces, we hope new inquirers will understand our inability to give their wants the consideration they would ordinarily receive.

Gear Specialties HICAGO

### SPEED with SAFETY MACHINE REPAIRS

USE OTC TOOLS

The easy, safe, quick way to remove and replace wheels, gears, bearings, shafts, sleeves, pulleys, etc.

The oTc PULLING SYSTEM includes Pullers and Pushers for every need.

#### OTC GRIPOMATIC PULLERS

have a patented grip which prevents slipping, avoids damage to costly parts, re-duces accidents. Designed to facilitate working in close quarters.

SPECIAL PULLERS and other industrial tools designed and built for special

needs.

PLANT MAINTEN-ANCE BULLETIN No. PE-1520.

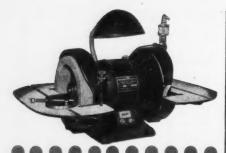


5 TO 50 TONS

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### OWATONNA, MINN

### STEEL SHOP STOOLS ALL SIZES AND STYLES Fabricators of all types of steel shop equipment—Tote boxes, Barrels, Cabinets, Shelving, Etc. Write for general catalogue. Spring Plant Sheet Metal Plant 1281 EAST 38th STREET EAST 49th and HARVARD AVENUE CLEVELAND WIRE SPRING CO. . CLEVELAND, O.



### Prosser

### CARBIDE TOOL GRINDER

**Quick Deliveries from Stock** 

Removes metal fast when rough grinding.

Finish grinds smooth, keen cutting edges.

Oversize 7" wheels give greatly increased wheel life.

This grinder will quickly pay for itself by increased tool performance and life between grinds.

Write for details of this and heavy duty Carbide Grinders.



hand, the Speedgrip-Automatic Adjustable Wrench is available in nut and pipe wrench types in four different sizes.

### Foot Control for Mead Drill Press Air Clamp

A foot control designed for use with Mead Drill Press Air Clamps is announced by the Mead Specialties Co., is S. Market St., Dept. 10A, Chicago, III.

The control is suitable for application in cases where the drilling operation



Foot Control for Mead Drill Press Air Clamp

involves rapid change of workpleces, since it releases both of the operator's hands for use in feeding work to the drill press.

#### **Detroit Tap Reconditioner**

Designed to alleviate difficulties in obtaining the vast numbers of precision ground taps required for war production needs, the tap reconditioner shown herewith is announced by the Detroit Tap & Tool Co., 8432 Butler St., Detroit, Mich. Combining in one unit facilities for chamfering, spiral pointing, and point polishing, the Detroit Tap Reconditioner serves to eliminate delays in tap replacements by simplifying reconditioning of taps.

The tap chamfering unit located at the left of the machine is of the precision collet type, assuring maximum locating accuracy with quick changes. The unit is designed to accommodate collets from the smallest machine screw

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UNIVERSAL EKLIND



U. S. HEADS



The United States Drill Head Co.

1954 Riverside Drive CINCINNATI, OHIO

### Cut Dressing Costs with WILLEY'S



547 W. Washington Blvd.

No resetting required. Accurate, precision dressing. For all makes of grinders. Lower production costs.

Layer upon layer of natural, whole diamonds, in tungsten carbide matrix. Many sharp cutting points in constant contact with grinding wheel during the entire life of the tool. Make comparative tests, for quality and cost per dress-

ing. 4 standard sizes. Prompt shipment. Prices include holder. Order today! Ask for Bulletin 142, covering Willey's Standard Tungsten Carbide Cutting Tools and Torpedo Type Dressers.

No.	Usable (	QUANTITY PRICES				Wheel	
	Diameter	Length	1-25	26-50	51-75	76-100	Didmeter
W-3	18	18	\$11.00	\$10.00	\$ 9.00	\$ 8.00	6 to 12
W-4	11	3/8	13.00	12.00	11.00	10.00	12 to 20
W-5	3/8	13	15.00	14.00	13.00	12.00	20 to 24
W-6	78	78	17.00	16.00	15.00	14.00	24 to 42

WILLEY'S CARBIDE TOOL CO.

1340 W. Vernor Highway,

Detroit, Michigan



e Pioneers in the riveting field. Head rivets from smallest to %" diameter, either by noiseless spinning or vibrating hammer method.—Sizes to meet all needs.—Types include Vertical and Horizontal Multiple Spindles.

Write for literature—and don't forget to send samples.

THE GRANT MFG. & MACHINE CO. 96 Silliman Ave. Bridgeport, Conn. size up to the 14-inch standard to shank size.

Taps of from two to seven flutes may be handled through the provision of a indexing drum, indexing being account of the provision of the indexing drum, indexing being account of the pulling the dual purpose to trol lever sideways to release the spring plunger. Proper index for different numbers of flutes is selected by moving the drum assembly in or out until the number corresponding to the number of



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Detroit Tap Reconditioner

flutes appears in an inspection aperture. Graduations are provided for adjustment to desired chamfering angle.

Safety stop pins limit the movement of the chamfering unit for taps of different numbers of flutes. A manual type diamond dresser is provided for the chamfering wheel. Handwheel significant for wear of wheels is provided by mounting the entire grinder assumbly on sturdy ground rails.

The oversize grinder motor is of the double-end shaft type with dust-proof



NICHOLSON

TYPE A-STEP JAW DESIGN

Size No.	Range of Bores Taken	Net Price
1A	1/2" to 1"	\$12.00
2A	1" to 11/2"	16.00
3A	11/2" to 2"	23.00
4A	2" to 3"	34.00
5A	3" to 4"	40.00

## **EXPANDING MANDRELS**

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by moving at until the number of



### \* step - up production to war-time efficiency

Economy tools . . . for holding work while being machined between centers on lathes, grinders, millers, shapers, etc. Hardened tool steel, accurately ground. Sold singly or in sets. Prompt delivery. Write for bulletin.

#### TYPE B-STRAIGHT JAW DESIGN

_			
Si	ze No.	Range of Bores Taken	Net Price
_	1X	1/2" to 18"	\$10.00
	2X	%" to 21/32"	11.00
	2X 3X	21 /32" to 3/4"	12.00
	00	3/4" to 7/4"	14.00
	0	%" to 1"	16.00
	Ĩ.	1" to 11/4"	18.00
	2	11/4" to 1 1/4"	21.00
	3	1 % " to 2"	29.00
	4	2" to 21/2"	40.00

Other sizes taking up to 7" (Prices subject to change)

W. H. NICHOLSON & CO., 136 OREGON ST., WILKES-BARRE, PA.

# MAC-IT Quality Alloy Steel Screws

Socket Head Cap Screws \* Hollow Set Screws \* Stripper Bolts \* Hexagon Socket Pipe Plugs \* Square Head Set Screws \* Hex Head Cap Screws

4

Made of alloy steel, milled from the bar with die-cut threads, and heat treated for maximum strength

THE STRONG, CARLISLE & HAMMOND CO.
1392 West Third St., Cleveland Ohio

perture.

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construction, and is mounted on ball bearings.

The spiral pointing unit at the right of the machine employs a saucer type wheel, and its fixture is designed to accommodate taps from the smallest machine screw to 1/2 inch diameter, using the same precision chuck. Any desired angle of spiral point may be ground by setting the unit according to graduations on the support housing. Taps of two, three, or four flutes may be spiral pointed. To index the tap, a trigger is pulled back, thus causing the fixture to rotate to the next flute position of the

interchangeable index discs. Correct depth and hook desired in spiral point. ing are obtained by means of simple manual vertical and horizontal feed at justments. A safety stop to limit angular swing of the spiral pointing unit is

A separate polishing unit for spiral points, and so on, is provided at the top of the machine base. The unit is operated by a separate motor and fitted with with a cone-shaped wheel.

All wiring of the Detroit Tap Recon-ditioner is internal, terminating in an external fuse and connector box for simple connection to any 110 volt, 50 or 60 cycle outlet. Large storage capacity is provided in the base of the machine for collets, grinding wheels, and so on.

### Hammons `NO-SPLASH" CARBIDE TOOL "WET" GRINDER



### MODELS "10" and "14"

An Innovation! Scientifically designed, concealed wheel guards keep you dry while you grind "WET." No Splash! No Spray! New guards permit greater working area around wheels, full view - speeds up production.

#### WRITE FOR LITERATURE

Complete Line - Chipbreaker and Carbide Tool Grinders



1615 DOUGLAS AVENUE, KALAMAZOO, MICHIGAN Egetern Bronch, 71 West 23rd Street, New York City

#### Vernon 6-Inch Universal Index Centers

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Machinery Mfg. Co., 1915 E. 51 St., Vernon, Los Angeles, Cal., has placed on the market the Vernon 6-Inch Universal Index Centers shown in the illustration. The centers are extremely useful in a wide variety of indexing operations and are rigidly and accurately constructed. The compact design is said to permit maximum distance between centers when used on the Varnon No. 0 or similar sized milling machines. The index plates furnished a standard equipment of the centers are designed to divide all numbers to 50 and all even numbers to 100 with the exception of 96.

By means of a positive clamp, the head can be set at any angle from 10 below the horizontal to 10 deg. past the perpendicular. The worm and worm gear in the head are accurately cut, with provision made for take-up in case of wear. The worm is quickly and easily accessible by removing cover



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9t's a tough worm says this bird.

'It twists and it bends While I pull and I shake, And give it the works, But still it won't break."

#### **ECLIPSE AVIATION**

Seamless Flexible Metal Hose Manufactured and Sold By
Division of Bendix Aviation Corporation PHILADELPHIA, PA. DEPT. No. 2

### WHITNEY LLING CUTTERS

for Uniform Seating of Whitney Woodruff-type Keys



No need for skilled labor ... or for filing and fitting . . . when Whitney Milling Cutters are used for seating Whitney Keys. Cutters are made in all sizes to correspond with the keys which can't roll over. Complete information in Catalog V-111. Write.



The Whitney Chain & Mfg. Co. HARTFORD, CONNECTICUT

### USE INDUSTRIAL BAGS

90% PACKING LABOR IN SHIPPING SMALL PARTS

Time studies reveal that industrial bags can save up to 90% of packing time and labor. The reason is simple—it's a lot faster to "just pick it up and put it in" than to wrap or package in more expensive containers.

Cotton bags really offer maximum protection at minimum cost. Use them to tie parts to products, to ship and mail small parts economically, and to mail samples right with letters. Order suppliers to use them in shipping to you. Drop a line for free samples and full information.



"Efficient as a Zipper!"



April, 1942

MODERN MACHINE SHOP

305



Vernon 6-Inch Universal Index Centers

plate. The ratio of worm to worm gear is 40 to 1.

The spindle, which is 1% inches in diameter, has a No. 9 B & S taper and is threaded on the nose. A take-up nut is provided on the spindle for end thrust.

The wide base castings of the centers provide large supporting surfaces against table top. Bases are hand scraped for accurate alignment with centers.

Standard equipment of the centers includes three index plates with chart for using same, four hold-down bolts, and four table slot tongues. Net weight of centers, 30 lb., shipping weight, a pounds.

### Barnes No. 78 Improved Precision Cutter Grinding Machine

Especially useful in the manufacturing of rifles, pistols, and so on, the Barnes No. 78 Improved Precision Culter Grinding Machine shown herewith has been brought out by the General Machinery Corp., 140 Federal St., Boston, Mass. The machine consists of a substantial cast iron table supported by an all-metal, square-base pedestal. On the table top is mounted a precision grinding wheel which is adjustable, forward or backward to meet any grinding requirement, by means of a slide track and tightening screw.

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The grinding wheel is driven by a round, endless belt running from a 1/4 h.p. motor, hinge-mounted in the base. The motor can be brought forward by screw adjustment as the wheel wean down. A former pin projects from the surface of the table and provides a rest for the tooth of the cutter being ground. The height of the rest is fixed at a definite distance below the center



# SPEED UP! With the CATSKILL Model W—Wet Type Abrasive Cut-Off Machine

Fast, smooth cuts in solids to 2", tubings and shapes to 3". Will not burn or leave objectionable burr. High alloyed hard steel and many of her materials.

Write for detailed information, Bulletin No. 2.



CATSKILL METAL WORKS, INC.

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### Precision chine

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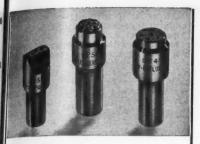
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#### MEYERS "Dia-Brasive" MULTIPLE DIAMOND POINT DRESSERS for Efficient, Economical Service

With "Dia-Brasive" Multiple Point Dressers, numerous sharp points are always exposed to the work, or face of wheel. exposed to the work, or face of wheel. New points can be secured by turning dresser a quarter or half turn. The small diamonds are more reasonable in price, and remain sharp longer, than large stones. We also make a complete line of single point diamond dressing tools. Special dressers built to order. Write for new literature. new literature.

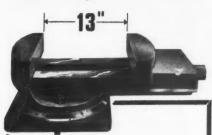
W. F. MEYERS COMPANY, Inc. Dept. MS., BEDFORD, IND., U. S. A.



QUICK DELIVERIES OF LARGE ORDERS Annual capacity over 1,500,000 Precision Bushings. Small orders from finished or semi-finished stock. Ask for Catalogs and Lists

FREDERICK M. LASERSON CO. 4518 Avaion Blvd. Los Angeles, Calif.

# A HIG VISE



### . . and Precision, too!

It's new-larger-heavieraccurate! Designed and built to fill the need for precision on the big vise jobs. Note the heavy jaws, longer ways, broad base and extra swivel bearing surface of this Rousselle Victory Vise. Once swivel is set, it stays put! Built to cut set-up time in half made in three sizes: 6 in., 9 in, and 13 in. Made by the manufacturer of Rousselle punch presses.

Write for Bulletin MM42 and prices.

Distributors: A few select territories still available.

DAVID J. ROSS

### MUNDING BENCH RADIAL DRILL

Combines the convenience and accuracy of a sensitive drill, the range and capacity of a large drill, with the speed and flexibility of a radial.

bility of a radial.
Finger - tip selection of speeds.
Table swivels and tilts to any angle.

UNEQUALLED RANGE

Drills to center of 48" dia. circle, 18" travel of head on arm. 17" travel of grum on column.

rayel of head on arm. 17" travel of arm on column. 34" drill capacity. Speeds: 175 to 3675 r.p.m.

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SAVAGE NIBBLING MACHINE

FOR TUBE SLOTTING AND TUBE SHAPING—FOR FAST AND ACCURATE CUTTING OF FLAT SHEETS BY TEMPLATE OR TO A SCRIBED LINE.



Showing Tube Cutting Attach-

ments and Samples of Work

Cutting Capacities

Flat Sheets Mild Steel 3/4" Tough Alloys 3/8"

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Wall thickness to 18"
1" I.D. to 36" O.D.

Throat Depth

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Manufactured by

W. J. SAVAGE COMPANY
KNOXVILLE Since 1885 TENNESSEE

Pioneer Manufacturers of Nibbling Machines

of the wheel to give the cutter tooth a standard degree of clearance.

The Barnes Precision Cutter Grinder is provided with two diamond truing devices, or dressers, one for truing the grinding wheel surface, the other for truing the side. These dressers are mounted upon hardened feet and slide over the surface of the table. Each is provided with a V-groove to facilitate the engagement of the former pin and



Barnes No. 78 Improved Precision Cutter Grinding Machine

diamond dresser with the grinding wheel.

The diamond in each dresser may be adjusted by placing the dresser in contact with a setting rod fixed on the grinding wheel head, and then simply unclamping, adjusting, and reclamping the diamond holder. Thus, when the device is placed against the former pin and turned to the proper position, the edge of the wheel is trimmed to the exact shape of the pin, and that part of the periphery of the wheel level with the top of the rest is trimmed to an exact vertical alignment with the templet-guiding surface of the pin. Accu-

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ter tooth er Grinder ond truing truing the other for essers are and slide Each is facilitate er pin and



#### An Inexpensive ABRASIVE GRINDER ...

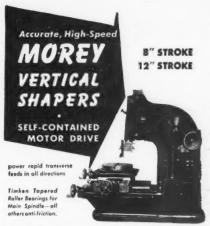
"Bullt Like a Machine Tool"

The Hormel-M Grinder is sturdily built with a supporting leg under the grinding table to eliminate vibration and tipping due to pressure on the belt. Ball bearing throughout. Equipped with ALEMITE LUBRICA. TION complete with grease gun.

Write for illustrated folder on this and other styles and sizes.

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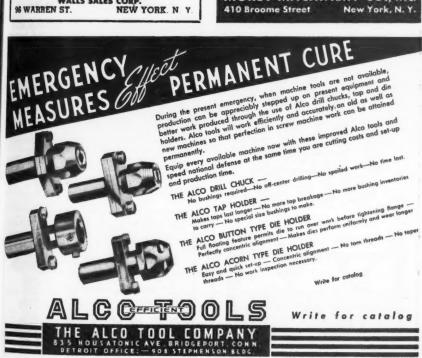
96 WARREN ST.



Built to highest accuracy standards the MOREY VERTICAL SHAPER is simple for tool-room manufacturing. Power feeds and power rapid transverse feeds in all directions are instantly available in all operating positions.

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MOREY MACHINERY CO., INC. New York, N. Y. 410 Broome Street



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racy of alignment is independent of the diameter of the grinding wheel.

A cutter jig, also mounted on hardened feet, slides freely over the surface of the table. This jig carries a horizontal cutter arbor having its center line at the same height as the top of the rest. Underneath the jig is a templet, the front edge of which conforms to the required shape of the cutter or gang of cutters. Means are provided for adjusting the cutter arbor longitudinally and the templet transversely without disturbing the parallelism existing between them.

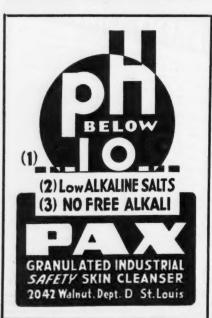


#### Cut Set-Up Time 75% through use of the New Advance Clamps (the only T-slot clamps)

Clamp directly over work. For use on all machines with T-slots. Standard and Heavy-Duty type.

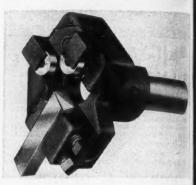
Duty type.
Write for circulars.

#### ADVANCE MACHINE WORKS 3727 Weisser Park Fort Wayne, Indiana



#### Boyar-Schultz Model "A" Screw Machine Box Tool

Designated as the Model "A," a but tool for automatic screw machines is now being marketed by the Boyar-Schultz Corp., 2120-C Walnut St., Chicago, Ill. The tool is simple in design



· No

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Boyar-Schultz Model "A" Box Tool

and can be easily set up and adjusted For regrinding the tool bit, the latter can be removed from the holder, ground, returned, and set in the correct position in a minimum of time.

position in a minimum of time.

The Model "A" box tool is of strong construction. The body is made from forged steel and heat treated for maximum physical properties. Other part are machined from heat-treated alloy steels. Due to the strength of the tool and the accuracy with which it is made fine adjustments are said to be possible which hold throughout long runs.

The Boyar-Schultz Model "A" Box Tool has an attractive satin-black finish designed to resist rust, and is available

in three sizes.

### The BARNES Motor Driven Precision CUTTER GRINDING MACHINE

For Precision Grinding of Formed Milling Cutters used in the manufacture of rifles, pistols, etc.

GENERAL MACHINERY CORP. 140 Federal St., Boston, Mass. Tolephone Liberty 4826



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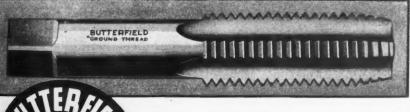
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MOOTH and compact. Constant accuracy. Parts subject to wear are hardened. Large offset adjustment eliminates need for offset boring bars. Lead screw is hardened tool steel. Its threads are ground from the solid AFTER hardening.

Criterion heads are unexcelled in accuracy, in ability to withstand constant use. Two sizes 14" and 3". "and 1" bar capacity. Order from your dealer or write direct. Request free literature. No obligation.







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You buy the profits that taps give you. Butterfield's long life and low cost per ac-

curate threaded hole prove their superiority and profit possibilities.

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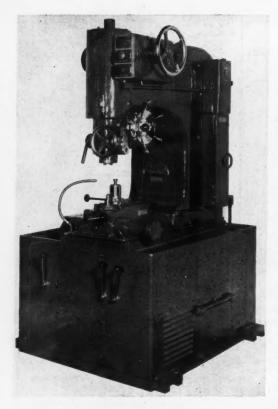
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April, 1942

MODERN MACHINE SHOP



Snyder Semi-Automatic Milling Machine

Clearances for articulated connecting rods can be milled in the master rods used in radial aircraft engines by means of a semi-automatic milling maSnyder Semi-Automatic Milling Machine

chine built by the Snyder Tool & Engineering Co., Detroit, Mich. Both roughing and finishing operations are performed on the machine, which is designed to handle either solid or split-type rods. Since the cuiting cycle of the machine is automatic, the machine being hydraulically operated and electrically controlled, one unskilled operator, it is claimed can maintain continuous production attending several such machines.

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In milling master rods, the main bore of the master rod is located on a plug, and a bored and reamed hole for the articulated rod is positioned on an eccentric bushing. The part is then hydraulically clamped by means of a clamping bolt and a C-washer over the hub. The cutting tool is rotated by a vertically adjustable quill-type spindle, which is worm wheel The hydraulically-opdriven. erated eccentric bushing acts as a driver for the path of the cut. A pilot light indicates completion of the machining cycle. at which point the operator indexes the part, without unclamping it, for the next cutting cycle.

Lombard Type "A" Dial Gage

A line of dial gages ruggedly constructed for long, accurate service, to be known as the Type "A," is now being marketed by the Lombard Government

IN Active SERVICE EVERYWHERE

CADILLAC PORTABLE ELECTRIC COMBINATION BLOWERS & SUCTION CLEANERS

PROVIDE AN EASY, ECONOMICAL WAY TO RID MACHIN-ERY AND EQUIPMENT OF DUST AND DIRT. DON'T LET DANGEROUS DUST AND DIRT SLOW DOWN YOUR PRODUCTION.

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"All-Way" LEVEL



The FELL Precision Level is made to show the level of all ways at once. This eliminates disturbing the first level when leveling the second. Graduations are in .0005" per foot and form squares about a circular bubble, thus giving co-ordinate readings and showing direction and amount of slope, if any.

MADE IN TWO SIZES 31/2" x 6"

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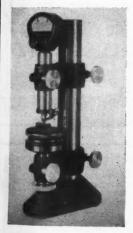
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• Three grades of diamonds. Common quality \$12 per karat. Medium quality \$24 per karat. Select quality \$48 per karat. (Contour template diamonds supplied only in Medium and Select quality.)
All diamond sizes \$4 to 10 karat are nib mounted for immediate shipment . . . Billed subject to approval. Specify quality of diamond wanted. We recommend a minimum size of one karat for each 6' diameter of grinding wheel. (24 hour resetting service, \$1.00 post paid.) Grinders instruction card free,

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"Mikro" (Minute)

### **Frictionless Amplification**

Complete elimination of friction, lag, and backlash insures positive, dependable repeat readings. Pointer responds instantly to the slightest movement of measuring tip without swinging past the true reading. No waiting for pointer to come to rest.

No lights or electro magnets are used, as the amplification is 100% mechanical, thus eliminating a warming up period to permit the temperature of the instrument to become stabilized.

There are no electrical connections thereby enabling the instrument and stand to be readily moved about in the shop, for use in different locations.

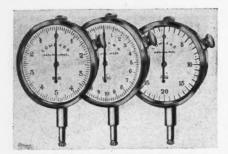
> Graduated--.0001" to .00001" Graduated-.001 mm to .0002 mm

SWEDISH GAGE DETROIT, MICH. 7310 WOODWARD

April, 1942

MODERN MACHINE SHOP

313



Lombard Type "A" Dial Gage

nor Corp., Ashland, Mass. Brass gears and cases are used on all gages. Spindles are of stainless steel. The gages can be furnished with plain back if desired for mounting by clamping on the bushing, but unless otherwise specified are supplied with standard lug back. Dials are 2 inches in diameter and turn to set the zero to pointer

The Lombard Type "A" Dial Gage is available in three models; namely, A-10 which is graduated to read in one tenthousandth of an inch, A-20 graduated

to read in one-fifth of one-thousandth of an inch, and A-30 graduated to read in one-thousandths of an inch.

#### G-E Tri-Clad Motors

A vertical general purpose polyphase motor, vertical shielded polyphase mo-tor (1 to 20 h.p.), and vertical shielded single phase motor (1 to 50 h.p.) have single phase motor (1 to 50 h.p.) have been added to the line of Tri-Clad mo-tors marketed by the General Electric Co., Schenectady, N. Y. The shielded-type motors are especially suited to pumping applications, and the general purpose motor is suitable for use in the machine tool industry as well as for agitators, mixers, and similar applications.

The compact cast iron frame and cover of the general purpose motor are designed to give added protection to electrical parts without adding mat-rially to the overall height. The use of Formex wire, new punchings and coil shapes, double-end ventilation, and balanced design are features contributing to long life.

Accurate alignment of the motor with the driven unit is assured by machined rabbets on the stator frame and base



The only hand grinder with spindle speed of 100,000 R. P. M. on 100 pounds air pressure. It has revolutionized hand grinder performance. Can be directed in any working position; operates with extreme case. Steel construction throughout. Formed to fit the hand. Weighs only 14 czs.

Also other models and Air Line Filters and Automatic line lubricators.

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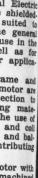
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11. 1942







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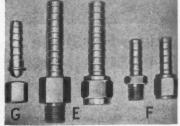




Only Air-O-Chek Air Guns have the enclosed lever that operates the valve thru a ball and socket joint. All moving parts enclosed within the valve and the hose.

Operators say, "It's easy to use." Production men say, "It keeps working—doesn't leak —saves air." Maintenance men say, "We install long and feath long." stall 'em and forget 'em."

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Fittings for Air and Welding Hose. Standard and extra long shanks. Shipped from stock. Catalog on request.

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Rotating weight and thrust are solidly transmitted to the supporting base through the lower bearing, which is fitted to a one-piece base. Bearings are of the deeply grooved type and are encased in machined cast iron housings.

All openings in the general purpose motor are shielded to bar the entrance of chips or other falling objects. A variety of bases is available which enables the motor to meet many applications and mounting requirements. cessibility of grease fittings permit rapid lubrication without disassembly of the motor, and the convenient loca-

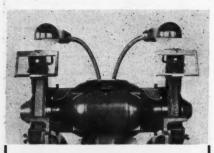


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Speeds layout on all metals. Gives clean accurate detail. Won't chip, crack or flake off. Comes 8 ox. brush-in bench cans, also pts., gts., gals.

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Avoid precious hours lost . . . costly slowdowns . . . unnecessary spoilage . . . all due to eye fatigue. VIMCOLIGHT your machines as Cincinnoti Electric Tool Co. have lighted this grinder. Flexible; non-glare; designed by industrial lighting specialists.

### VIMCO MANUFACTURING CO



G-E Tri-Clad Vertical General Purpose
Polyphase Motor
G-E Tri-Clad Vertical Shielded-Type Motor

tion of eyebolts makes the motor easy to handle. For taking speed measurements, the monogram cap is removed from the upper end shield of the motor.

The polyphase shielded-type motor is available with either solid-shaft or hollow-shaft construction, while the single phase shielded-type motor is available only with solid-shaft construction, Both shielded types are for normal thrust or high thrust applications. The cover is

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### IFORD "SUPER-SPACER" urpose pe Motor For milling, drilling, grinding, tor easy slotting, jig-boring, etc. Rigid measure. control of operation and accuremoved racy under heavy cuts. Foole motor motor is proof. or hol-Write for folder. e single

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Simply insert in holes, invert, strike sharply and you have centers and drill circles perfectly located. Reduce time and eliminate spoilage of other methods. 7 sizes U.S.S. Inexpensive—Last for years. Write for Circular.

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By a Quick, Easy, Inexpensive Method Your business letterhead will bring literature. WATTS BROS. TOOL WORKS WILMERDING, PA.



contoured to deflect dripping liquids and falling objects. All openings in the stator frame and end shields are protected against the entrance of splashing liquids. Air is discharged downward allow velocity, thus permitting little or no dust disturbance around the motor.

The polyphase shielded-type motor is suitable for outdoor operation except where extremes of moisture, dust, or other harmful agents make the selection of fan-cooled motors more conomical. All frame sizes have common mounting dimensions, making possible interchangeability of many horsepower and speed combinations, including single phase ratings. The motor can be rotated to any one of four base positions without modification of the supporting structure.

To facilitate installation and impeller adjustment in pump installations, the polyphase shielded-type motor can be obtained with hollow shaft. In such installations, the pump shaft passes through the hollow motor shaft and is supported on the upper end by an adjusting nut. Torque is supplied to the pump shaft by either a non-reversing ratchet or jaw-type coupling.

The non-reversing ratchet is designed to eliminate motor reversal which might result from the reversal of phase rotation or from the backward flow of water through a pump and thereby cause turbine action. The jaw-type coupling provides a simple means for connecting the motor to the driven machine where pump reversal is unimportant.

#### Mastercraft 4-Way Indexing Turret Tool Post

A completely redesigned, streamlined lightweight, fast-acting Mastercraft 4 Way Indexing Turret Tool Post is now



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FRICTION **TAPPERS** 

SPECIAL THREADING MACHINES

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April, 1942

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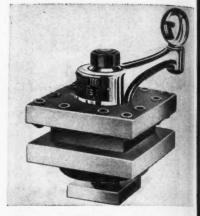
TOOLS

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being manufactured by the F & M Sales Co., Hollywood, Cal. Precision manufacturing methods are said to render all parts completely interchangeable, thus permitting the user to set aside the tool block with all tools remaining in place for future use while another tool block is being used on the same post. In this manner, many difficult setups may be preserved for subsequent runs at a great saving in set-up time.

Hardened throughout and self-compensating for wear in severe service, the Mastercraft 4-Way Indexing Turret Tool Post is especially designed for use on 10-inch South Bend and 9-inch Work-

**ALNOR"** Velometer



Mastercraft 4-Way Indexing Turret Tool Post

An All Purpose Air Velocity Meter--Instantaneous, Direct Reading.

Measures total and static pressures as well as velo-

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ILLINOIS Testing Laboratories, Inc. 153 W. Apstin, Chicago shop and similar lathes, as well a small screw machines. The unit is fixished in durable gun-metal, while the handle is chromium plated and provided with a swiveling ball. Four precision steel balls are employed in the block to ensure accurate indexing in all four positions.



### M-D Facing Heads With Automatic Food

Can be attached to Column Boring Bar, and Drilling or Milling Machine spindles. Single point tool travels radially, from center outward or reverse feeds automatically and covers faces 6" to 30".

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### DEARBORN Automatic Chucking and Indexing Fixture MILLS OVER 1000 PARTS PER HOUR

Work held by draw in collets. Collets open and close automatically. Work automatically ejected. Indexes without loss of time for milling 1, 2, 3, 4, 6, 8, 12 or 24 sided pieces. Minimum set-up time required. Speeds up production. Positive and accurate in operation.

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Double Pullmore

Pullmore Clutches are made in single and double types, for operation in oil or dry, in many capacities from 1 to 75 h.p. at 500 r.p.m.

## Clutches

# Pullmore Drives Rapid Traverse In HY-DRAULIC SLOTTER

A Single-Type Pullmore Multiple-disc Clutch provides reliable finger-tip control of rapid traversing in the powerful Hy-Draulic Slotter illustrated. It simplifies and safeguards speed changes, handles the load smoothly, has ample reserve pulling power. "The Pullmore works swell," says Chief Engineer . . . a fact you can check on any of many Pullmore installations in machine tools and other automatic or semi-automatic machines. Write for Pullmore Data Book showing examples.

Pullmores are sold by MORSE CHAIN CO. offices in principal cities.

Rockford Drilling Machine Division

Borg-Warner
Corporation

300 Catherine Street, Rockford, Illinois, U. S. A.



#### Fray "All-Angle" Milling Attachment

A milling attachment designed to speed up the manufacture of drill bushings is now being offered by the Fray Machine Tool Co., 503 W. Windsor Rd., Glendale, Cal. By means of the unit, the operation of raising and lowering the milling machine table is said to be eliminated. Through the use of a traveling quill, the stepped recess in drill bushings, it is claimed, can be milled to close limits on a production basis by semi-skilled operators.



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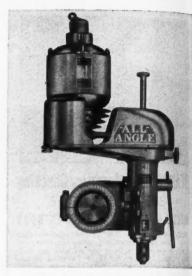


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The exclusive patented design of PECO Quick Action Clamps provides exceptional speed of opening and closing and assures a positive lock impervious to pressure and vibration. In models 1561 and 1514 handles are down out of the way when in the locked position, making it easier to get to work when machining, milling or fabricating.

In its full line of seventeen originally designed clamps PECO presents the only clamps with drop forged handles and clamping bars. Send today for catalog on PECO.

PRODUCTS ENGINEERING CO.



Fray "All-Angle" Milling Attachment

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Conventional "All-Angle" features of the milling attachment have been retained so that it can be used for milling, drilling, and so on, at all angles with one work setup. The necessary brackets are available for mounting the attachment on all makes of conventional milling machines.

#### "Quikcet" Fulcrum Leverage Speed Clamp

A fulcrum leverage speed clamp especially adaptable for use in defense production, to be known as the "Quikeet," has been placed on the market by the





Nameplate Detail Press

This machine quickly stamps details and serial numbers into name plates. Write for Particulars

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Saves Time...Taps...Trouble



Base, semi-steel casting, well ribbed and

Base, semi-steel casting, well ribbed and seasoned to prevent warping.

Two sliding parallel bars to hold work in place while tapping.

Quick changing adaptors, requiring but five seconds to change tap.

Steel spindle hardened, ground and lapped

Steel spindle hardened, ground and tapped to a perfect gage fit.

Spindle lock for holding spindle in position. Two spindle bearing bushings hardened, ground and lapped.

Handwheel, semi-steel casting with four inserted steel handles.

Bracket arm, semi-steel casting bottom scraped to insure spindle is periectly square with base. Capacity 4" to %".

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April, 1942

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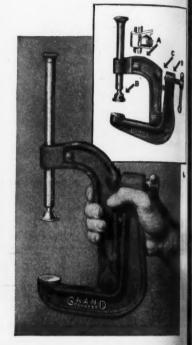


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Grand Specialties Co., Chicago, In Through setting with ratched rod, for second clamping and one-hand open tion are said to be possible. Referring to the illustration, "A" is



"Quikcet" Fulcrum Leverage Speed Clan

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are high quality chests that take first place in the estimation of toolmakers and machinists the country over. FREE Catalog.

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Quikcer Fulcrum Leverage Speed Class

spring activated pawl for ratchet, 's is a replaceable swivel, and "C" is a case hardened casting which contain tightening screw with fulcrum acting providing downward pressure on wath According to the manufacturer.

According to the manufacturer, with the Quikcet Clamp there is no slipping of work, even on beveled surfaces, Six screw tightening permits clamping to close quarters as well as quick release Rod and screw are copper plated. If shoes may be furnished for pipe and micholding.

### Truscon Corrugated Steel Box and Platform Unit

A corrugated steel box and platfor unit with hinged end door for efficient

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IDEAL for POLISHING LAPPING FINISHING of small parts.

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If WPB regulations are forcing you to change from tungsten high speed steel blades to molybdenum blades. remember this - that Clemson pioneered the molybdenum blade -that STAR "MOLY" was the first such blade put on the market-that Clemson has had more experience making molybdenum blades than any other manufacturer. STAR "MOLY" is still best.

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CLEMSON BROS., INC. Middletown, N. Y.

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April, 1942

handling small forgings, hot or cold, and other small metal parts has been designed by the Pressed Steel Division of the Truscon Steel Co., Subsidiary of Republic Steel Corp., Cleveland, Ohio. The bottom of the box is smooth and

The bottom of the box is smooth and of heavy gauge steel so that when placed on a rack and tilted approximately 20 deg. parts will flow easily through the door opening onto a table or other place convenient to the worker. The door is equipped with heavy duty forged hinges, reinforced and riveted in place. A slotted bar on one side of the door enables the door to be held open



Truscon Corrugated Steel Box and Platform Unit

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GRAY, Originator of First Practical Metal Cutter or Nibbler

Most modern Nibbler for Template Cutting, Tool Rooms, Shipbuilding, Aircraft Parts, Aircraft Tubing, Sheet and Plate Shops.

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The Truscon Corrugated Steel Mand Platform Unit may be used with forked trucks and may be equipped with tiering or crane lugs for efficient storage and handling.

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#### Strand Enclosure Safguard

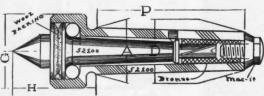
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Head swivels and locks from 10° below horizontal to 10° past perpendicular. Spindle taper.#98&5. The 3 index plates provided will divide all numbers to 100 (except 96T).

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**Speeds Machine Tool Operations** Leeps tools sharp longer, by removing metallic chips and dust that dull cutting edge. Quickly demagnetizes work held in magnetic chucks—tools, drills, punches, dies, etc. Powerful; portable; handy to use.

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> Removes the "hops" and "weave" from uneven grinders. Gives cutting and truing eflect almost equal that of a diamond.

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Strand Enclosure Safguard

Strand Enclosure Safguard can be quickly set up and is instantly adjustable for any size stock. The device is designed to permit front or side feed, all guize swiveling in or on, and can be easily de tached as a complete unit.

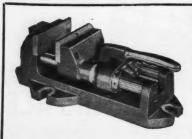
#### DoAll Saw Lubricator

Designed to assure long saw life, straight cutting and fine finish, a coolant attachment for Doll Contour Machina. to be known at the Doll Saw Libricator, has been placed on the

market by Continental Machines, It. 1306 S. Washington Ave., Minneapolis Minn. In use, the unit attaches directly on the post above the saw guide, if flexible feed line can be directed by apply the coolant to the correct postion. Since the amount of coolant required is small, a feed control valve mits the operator to regulate the application of the coolant to the work.

punch presses where blanking, notching, piercing, and cutting-off operations are performed is now being marketed by the Strand Mfg. Co., Inc., 158 N. Desplaines St., Chicago, Ill., The device, it is claimed, not only ensures protection for the operator but also provides freedom of action in feeding stock as well as clear vision of the work at all times.

According to the manufacturer, the



### Quick-Acting PRESTO - VISE

Sliding jaw is moved up to work with lever in raised position. Lever is then pressed downward to exert desired pressure on part being clamped. To release, lever is raised which disengages clutch and slide moves away from work.

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You cut days to hours...and hours to minutes when you repair machinery or fabricate metal products by the fast, economical method of electric welding with a Marquette A.C. Arc Welder.

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AND MONEY

NEW, perfected 2-way clamping arrangement permits changing or the adjustment of the boring bar without disturbing alignment of boring bar holder with the lathe—or, identical boring bar setting may be maintained for subsequent operations when boring bar holder is removed from lathe.

Any size boring bar (within capacity of holder) is instantly centered and clamped into place. Exclusive V clamp assures rigid, proper alignment. Sliding dowel maintains constant alignment of center post and V slots in body. No "fingering" or bushings required!

All Clayton Boring Bars are permanently marked in quarter inch graduations to speed production. Eliminates necessity for file and chalk markings. Allen set screws hold square boring bits rigid at all times.

Clayton Boring Bar Holders are made in sizes for 9" to 36" lathes. Holders available in sets complete with boring bars. Individual bars may be purchased in any quantity.

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In the contour sawing of steel and other metals having a relatively high tensile strength, the coolant supplied by means of the DoAll Saw Lubricator is said to prevent the saw teeth from heating up as they pass through the work, thus eliminating the possibility, particularly in sawing thick sections of the fine points of the saw teeth becoming annealed and breaking down. On metals having a relatively low tensile strength, such as aluminum, copper, leaded brass, zinc, and so on, the coolant is said to adequately prevent

build-up of the metal on the saw on the sides of the material, thus neducing saw wear to a minimum.

According to the manufacturer, light cutting oils and soluble oils have been



DoAll Saw Lubricator

found ideal for use with the DoAll Sar Lubricator. Carbon tetrachloride is also said to give unusually good results or some applications due to the fact that its rapid evaporation cools the saw. When carbon tetrachloride is used, car should be taken to have proper verilation to carry off the fumes.

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itself on a single fixture; it can save its cost on a few days' drill-press output. Reduces operatorfatigue. Saves hours and dollars in drafting room, jig department, tool room and production line.

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**CERROMATRIX** (Melting Temp., 250° F.) For securing punch and die parts, anchoring machine parts without expensive drive fits, for engraving machine models, stripper plates, chucks, short run forming dies and other metal-working applications.

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## Hammond "600" Dri-N-Wel Abrasive Belt Surfacer

The illustration shows "600" Dr. Wet Abrasive Belt Surfacer for giving, polishing, and surfacing operation which has been placed on the man



Hammond "600" Dri-N-Wet Abrasive Bell

by Hammond Machinery Builders, In. 1615 Douglas Ave., Kalamazoo, Mid According to the manufacturer, the manufacturer. chine can be adjusted from a vertical to horizontal position while in opention. The belt tension and tracking device can likewise be adjusted while the machine is operating, the adjustments being quickly made by two on-

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DROP FORGED STEEL

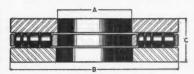
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3 PARK PLACE NEW YORK CITY

il, 1947 April, 1942

MODERN MACHINE SHOP

veniently located handles. The work table can also be adjusted to any de-

sired working angle.

The machine is totally enclosed for safety and is arranged for use with an individual dust collector or for connection to an exhaust system. The abrasive belt pulleys are made of cast iron and are dynamically balanced. The pulleys run on dustproof ball bearings and are properly lubricated. The vacuum drive pulley is said to eliminate belt slippage.

The Hammond "600" Dri-N-Wet Abrasive Belt Surfacer is available in both

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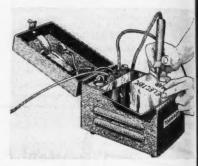


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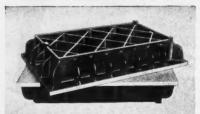
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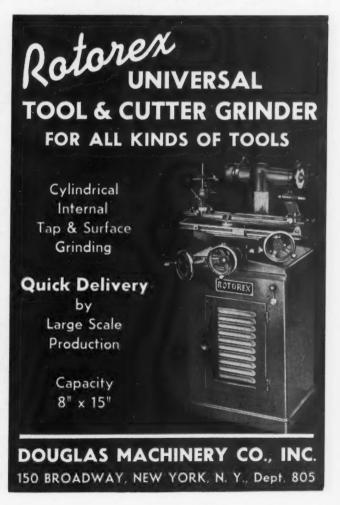
ray, authority, and correct nomenclature. In compiling his information, the author has had access to the specifications of many large manufacturing plants, the Federal Specifications Board, the American Society for Testing Materials, and the Society of Automotive Engineers.

R-S Standard Covers for ball and roller bearings is the subject of a four-page bulletin released by R-S Products Corp., 4530 Germantown Ave., Philadelphia. The bulletin treats flat, medium and deep covers in two types of fastening flange lug and round. Included are detailed drawings and tables giving sizes, styles, dimensions, and so on. Copy of Bulletin No. 11-C

facts they need in the selection and specification of materials. In the book, hundreds of materials — metals, alloys, refractories, abrasives, and so on—are arranged and indexed for instant reference and covered with regard to chief characteristics, comparative data, sources, substitutes, adulterants, and uses.

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"Grits and Grinds," Vol. 33, No. 1, is now available from the Norton Company, Worcester, Mass., upon request. The booklet includes an illustrated and descriptive article on the correct sharpening of taps; the first of a series of cartoons entitled "On the Grinding Line," and an item on safety standards for grinding, buffing, and polishing. Other short items include one entitled "If You Have a Cement Floor Problem," one on a 16-inch cylindrical grinder which has been raised to swing 24 inches, and another on a 10-inch Type LC Cylindrical Grinder.



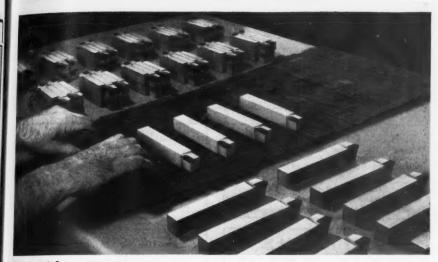
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Peerless Heavy Duty Vertical-Cutting Saw. The Peerless Machine Co., Ra-cine, Wis., has issued a four-page bul-letin which illustrates and describes in detail various improvements in Peerless Heavy Duty Vertical-Cutting Power Saw. Several applications of the saw are covered and complete specifications are given. Copy of Bulletin 53 free upon request.

"More Output for Defense" is the title of a 16-page catalog now being issued by the Reeves Pulley Co., Dept. MS. Columbus, Ohio, illustrating and de-scribing numerous uses and applications for Reeves variable speed control equip ment in defense industries and plant on many different types of machine. Copy of Catalog No. G-423 free upon request.



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The booklet contains information on how industry can obtain loans for equipment to make war armament, how small companies can form pools to obtain contracts, and other helpful data. A list of Regional Offices and addresses, the names of officers, and telephone numbers are included. Copy of booklet free upon request.

Producto Die Sets and Accessories for tool and diemakers and users of power presses is the subject of a 96-page, plastic bound catalog prepared by The Producto Machine Co., 990 Housatonic Ave., Bridgeport, Conn. The catalog is divided into five sections, each of which is conveniently indexed by means of a different colored tab.

Section 1 is devoted to master die sets, semi-steel and all steel; Section 2. standard die sets, semi-steel and all steel; Section 3, special semi-steel die sets; Section 4, all steel die sets, and Section 5, diemakers' accessories. Copy of Catalog No. 9 free to mechanical executives addressing a request on their company letterhead.



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"Drill and Reamer Facts" is the title of a 32-page booklet published by Whitman & Barnes, 2108 W. Fort St., Detroit, Mich. The "Drill Facts" section of the booklet contains illustrated and descriptive information on the design and construction of twist drills, correct drill pointing, as well as general sug-gestions in the proper use and care of drills. Recommended speeds and feeds, cutting compounds, and types of drill point to use when drilling various materials are also given.

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a short treatise on the design, construction, use, and care of reamers, cause of breakage, excessive wear, and so on. The booklet also contains other useful information such as tap drill sizes and basic thread dimensions, hardness conversion table, detailed dimensions of taper shanks and sockets, decimal equivalents of fractional, letter, wire gauge, and millimeter sizes, and so on.

Copy of the booklet is available free of charge to colleges, technical, trade, and engineering schools, as well as to individuals interested in information of this nature by addressing a request on their company letterhead.

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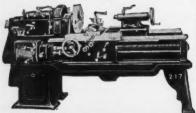
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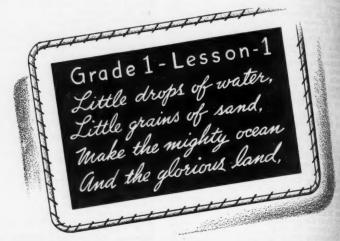
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## STEPS FOR LITTLE



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